vorak Hops On The
CD-ROM Bandwagon:
Page 262

Northern California's Computer Magazine
Nov. 25, 1991 • 89
FREE

MICROTIMES™

Momenta Unveils The "Pentop" Computer

The Notebook You Can Really Write On—And Run Lotus, Too

Momenta CEO Kamran Elahian: "I bought a Macintosh, and I bought some notebook machines, but I could never use them for very long, because I would go to many different meetings. I wanted a type of machine that was much easier to use, and that I could take with me anywhere." Story starts on page 110

Kamran Elahian, Beatriz Infante, and John Rizzo of Momenta

Micro Marketplace

Special Advertising Section For Bay Area Computer Buyers Starts On Page 70

Securing Your System

"Only by understanding how attacks on password security are carried out do you know what to look for to detect a breach, how to construct defenses, and how to evaluate the likelihood of different types of attacks for each system." Story starts on page 52

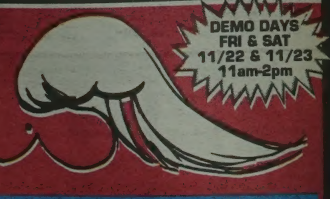
The Affordable Color-Mac Workstation

"More and more Mac users want to be able to include graphics, DTP, and multimedia as part of their regular work. Few of them can justify the investment in the heavy-duty desktop hardware of the full-time professional." Story starts on page 194

What's On Your Network?

"System analyst Devan Dewey uses NetOctopus information about software and hardware to look for problem areas on each Mac. 'It's a dream come true for someone who has to administer Macs over a 3000-mile area,' he says." Story starts on page 92

THANKSGIVING SALE-A-BRATION



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11/22 & 11/23
11am-2pm

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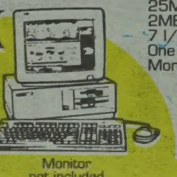
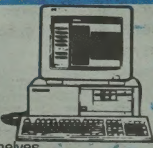


16MHz 80386SX
2MB RAM Expandable to 8MB on Motherboard
5.25" 1.2MB Floppy Disk
EMM/386 Utility Software
Serial/Parallel Ports
Clock/Calendar
IDE Hard/Floppy Disk Controller
Enhanced Keyboard
#1593112

Monitor not included

$1295

HP Vectra 25MHz 386

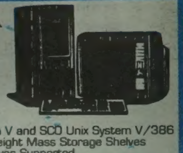


25MHz 80386 Processor
2MB RAM Expandable To 16MB
7 I/O Slots • 3 Mass Storage Shelves
One Serial/One Parallel •One Mouse Port
Monitor Not Included

NEW LOW PRICE!

#1567645 **$2499**

Vectra EISA 33MHz 486



33MHz 32-Bit i486 Based Processor with Integrated Coprocessor
EISA Based, 32-Bit I/O Bus:
Fully Compatible with OS/2, MS DOS 4.01, SCO Xenix System V and SCO Unix System V/386
8 EISA Accessory Slots: 6 Half-Height Mass Storage Shelves
5 1/4" and 3.5" Flexible Disk Drives Supported
Standard VGA and High-Resolution • Video Solutions Supported
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Monitor Not Included
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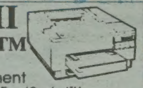
$5995

LaserJet III PostScript™



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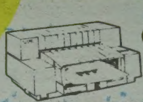

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Tired of hassling with dot matrix ribbons and tractor feeds? HP's InkJet Printer Family has very quiet consumables which take only seconds to load!

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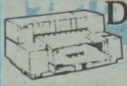

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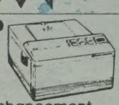

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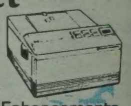

PCL-5 Resolution Enhancements and PostScript™ yield the highest quality laser output!
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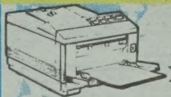

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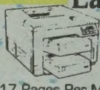

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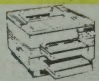

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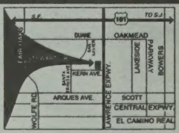

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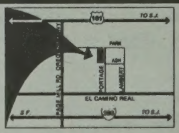

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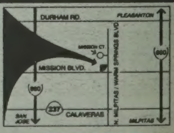

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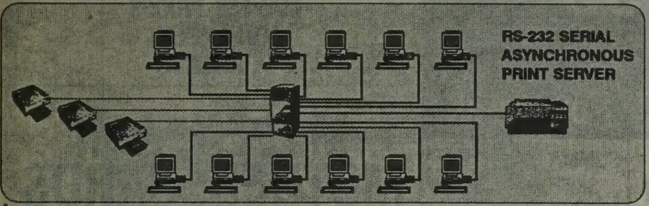
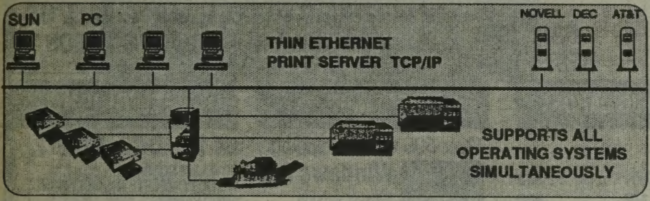


1. The XL-Series as the hub of a printer sharing network. With 10 to 18 ports, two parallel connectors and RJ12 twisted pair connectors for the remainder, this configuration allows you to create a stand-alone network and add stations as required.

XL-100S (10 port): Reg. $1,295, now **$695**, XL-110S (18 port): Reg. $1,595, now **$995**



2. The XL-Series as an Ethernet TCP/IP print server. Connect the unit as one of the nodes on your network and link-up to any one of 10 to 18 printers.

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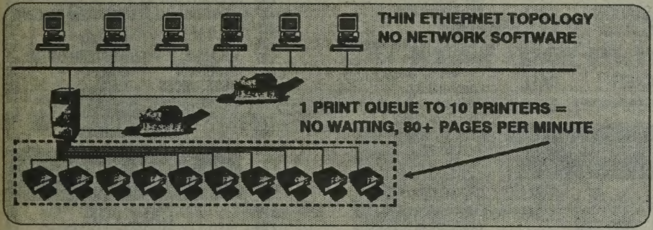
THIN ETHERNET TOPOLOGY
NO NETWORK SOFTWARE
1 PRINT QUEUE TO 10 PRINTERS =
NO WAITING, 80+ PAGES PER MINUTE

3. The XL-Series as a print server or peripheral sharing hub - using thin Etherent cables, but without network software. Ten printers in a class yield 80 pages per minute output - no queues and no waiting.

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The XL-Series provides a unique printer sharing solution - the same product family can be used in departmental level applications and in network environments. Unlike printer specific solutions with limited port options, the XL-Series can be used with all printers and plotters, with up to 18 ports in a single unit. Contact IMC DATA MANAGER today for all pertinent details: **800-537-5999.**

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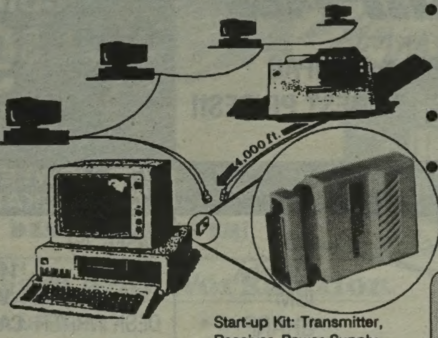
Start by connecting one printer to one computer with PRINT EXPRESS™ - then add up to 30 more computers, one at a time!



- **No special software - use with current applications (Word, Windows, Ventura, dBASE, 1-2-3, etc.)**
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Start-up Kit: Transmitter, Receiver, Power Supply and 50ft twisted pair cable.
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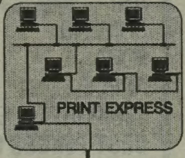
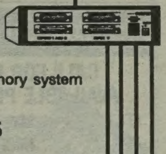


Share 3 PCs to 1 printer - all parallel - with the MultiPort Express™, then connect up to 30 more computers - one at a time - with Print Express



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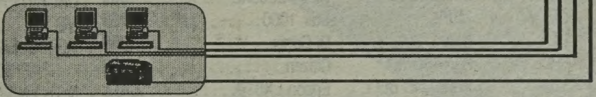

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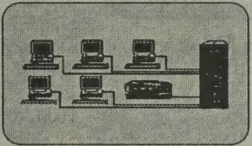

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- **Serial or Parallel - up to 1,000 ft on Twisted-Pair**
- **Comes with all cables and connectors needed to connect five users to a printer - no extras to buy.**

4x4 - 8 PORTS
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- **Multiple users to multiple printers**
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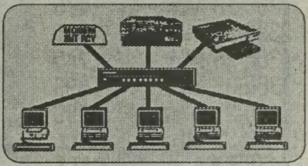

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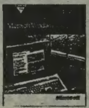

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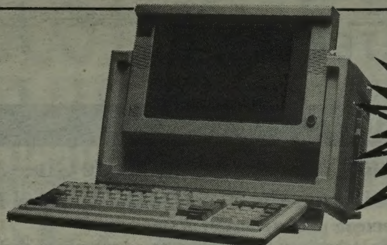
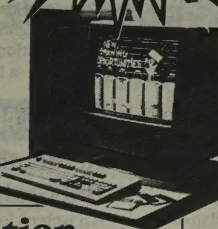


COLOR PORTABLE 486 CALL



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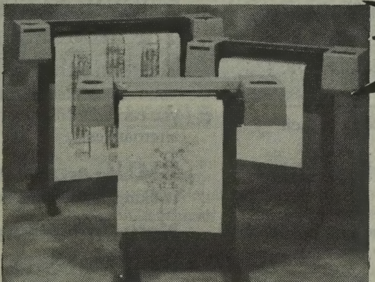

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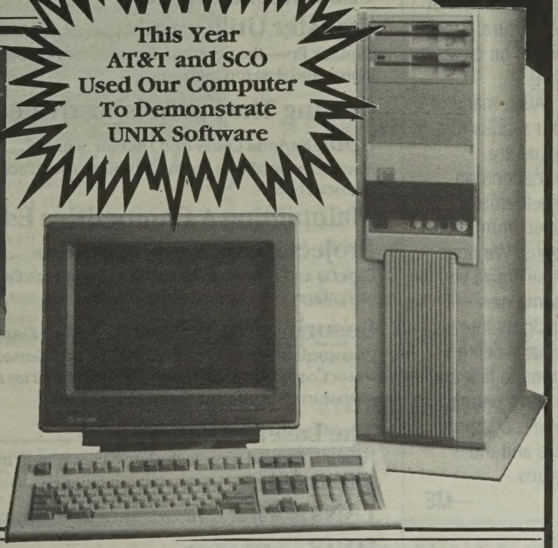

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While pen-based computing is one of the year's main buzz-concepts, much about its future remains to be determined, from the operating system standards to the breakthrough applications. Not content to wait for the revolution, Mountain View-based Momenta, a two-year-old startup, has released what it hopes will bridge the world of current standards and the handwriting environments of the future. Story starts on page 110.

Also, many of our stories this issue are variations on the theme of telecommunications. We hope they'll give you some new insights into what's being done to link and inform people using computers and modems.

—ME

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A Notebook You Can Really Write On—And Run Lotus, Too *By Mary Eisenhart* 110
Cover and contents photos courtesy of Momenta
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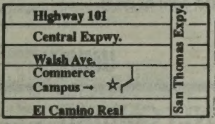

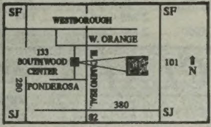

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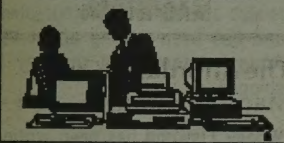

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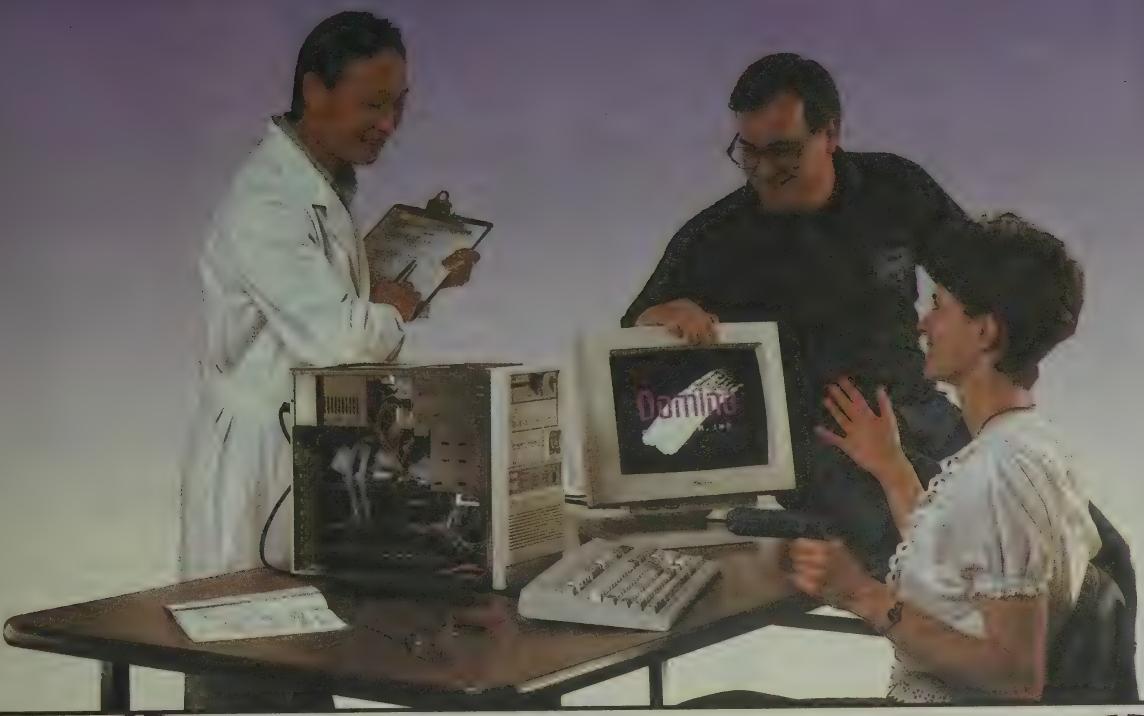

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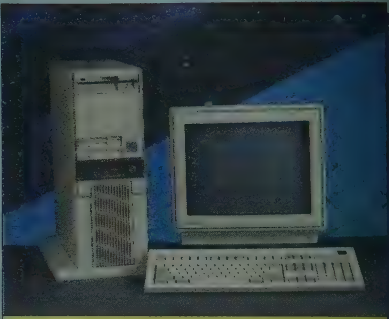

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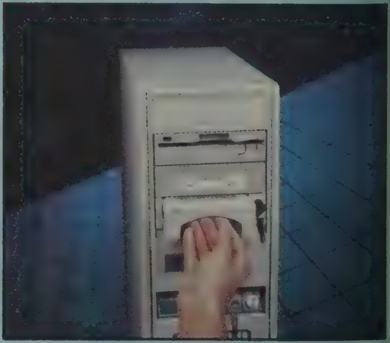

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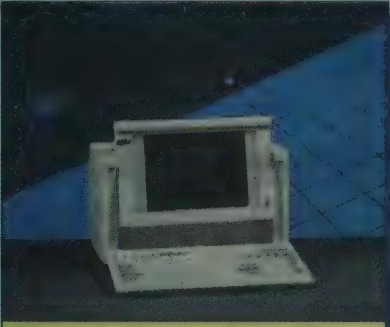

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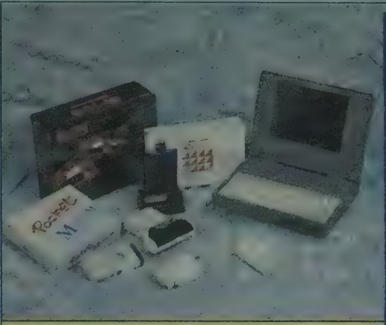

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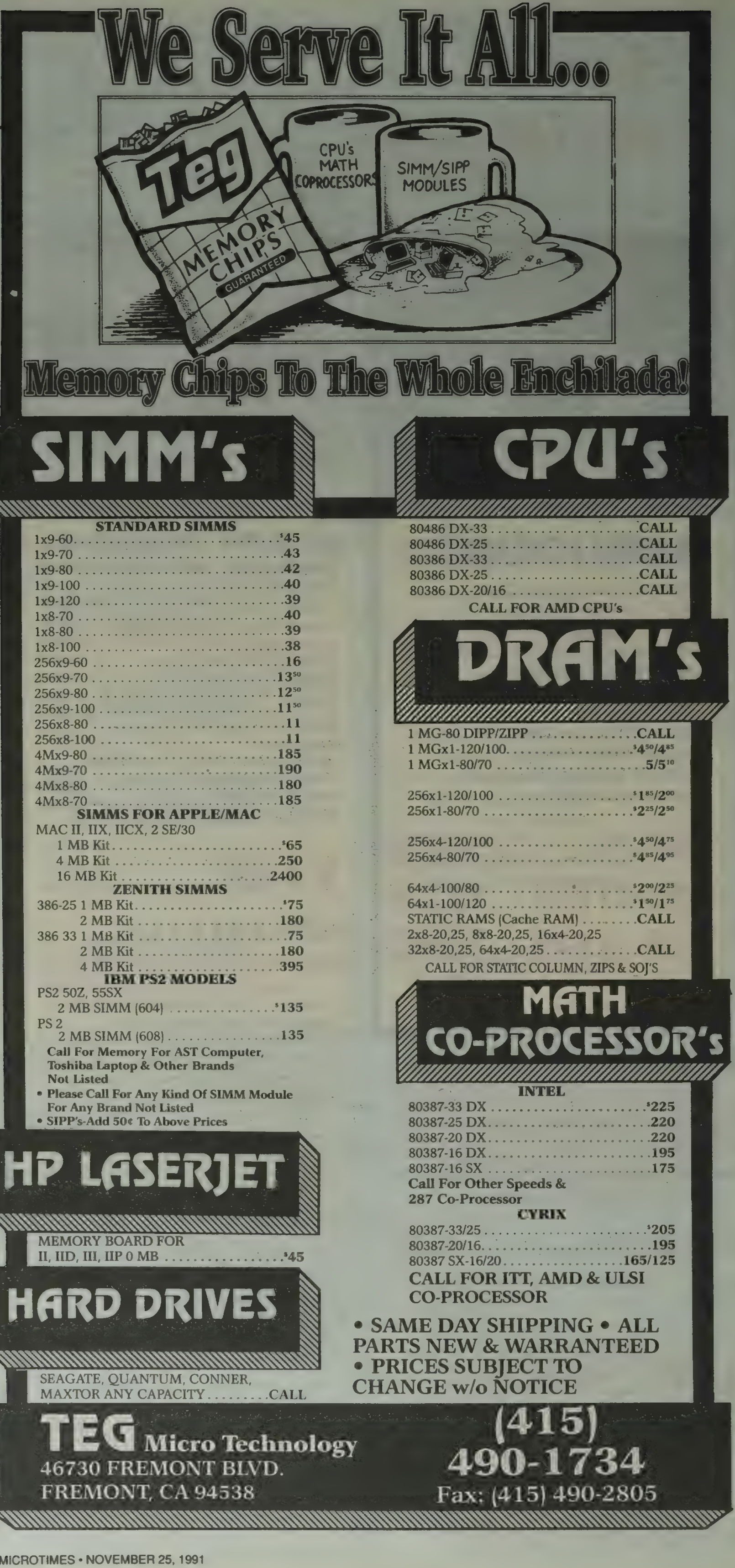

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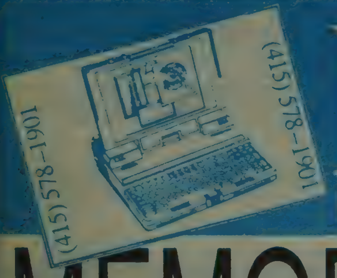

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Remembering Bill Graham

1931–1991

BY JOHN PERRY BARLOW

I took the Mac PowerBook 170 to Golden Gate Park for the Bill Graham memorial concert. Got a lot of work done between sets, too. Admiring strangers came up all afternoon to check it out. "Excuse me," said one guy, "but I've got a bet with my buddy over there—are you using Microsoft Word?" (I wasn't. He won.) "Gee, I wish I had a Powerbook," said another. "Is that the new Mac? Can I see it? Wow!" gushed yet another.

It might seem incongruous for a computer magazine to eulogize a rock 'n' roll promoter. But for one thing, unlike most of the computer press, we come from rock 'n' roll. Our parent magazine is BAM, *and that's where I started freelancing ten years ago. Certainly if Bill Graham hadn't catalyzed Bay Area music culture into its vibrant and economically viable state, we wouldn't be here. And as we've found ever since we started publishing* MicroTimes *seven years ago, the Bay Area music and computer worlds overlap in many, often surprising, ways—witness my afternoon in the park.*

PHOTO: RON DELANY

Personal involvement: Bill Graham making his annual midnight entrance as Father Time. New Year's Eve 1985–1986.

There's another thing. No matter how big his empire got, Graham never got complacent. Going the extra mile to make his customers' experience the best it could be, he set a companywide standard of service and excellence. For a couple of decades now, BGP employees have gone about their jobs as if Bill himself were about to appear and do it with them—as he often did. They're still doing it.

This is as it should be. Whatever business you're in.

Contributing editor John Perry Barlow (himself an example of the overlapping music and computer cultures) crossed paths with Graham quite a lot. So we asked him to say a few words…

—Mary Eisenhart

By Sunday, November 3rd, Bill Graham had been dead for more than a week and the world was starting to feel the way it was going to...more austere, businesslike, predictable. Generally less interesting. Certainly harsher. It seemed, as Grateful Dead sound designer Bob Bralove put it, that "the whole world just got a lot more like LA."

This was the least comforting thing he could have said, but I couldn't dispute it. When I reflect on the ingredients which determine the delicious flavor of my favorite city, I would have to say that Bill Graham has had a lot more to do with them than Art Agnos, or even Herb Caen.

San Francisco has been, for twenty-six years, the undisputed Rock 'n' Roll Capital of the World, a fact which has influenced its culture in countless ways, mostly by keeping the good juices of hedonism and iconoclasm hot and wet in its belly. Even the most orderly San Francisco bizdroids earn few demerits from the front office for shedding their suits and shaking their booties.

In large part, San Francisco boogies because of Bill Graham. I'm not saying he did it all. I've got such a faint belief in causality that I'm not sure anyone does all of anything. And it's certainly true that Ol' Babylon was well provided with libertines and wastrels before Bill started selling them tickets. It didn't get that nickname for its hanging gardens.

But Bill was like the crystal dropped in the supersaturated fluid. He catalyzed and organized the wild urges of the place into something more coherent. Reckless youth became, under his guidance, culturally sustainable for more than a generation. And as economically viable as air conditioning in Atlanta.

Bill's aptitude for commerce drew a never-ending hail of unfair criticism. Many seemed to think the whole San Francisco rock scene could have run just fine as a public charity if Bill's cupidity hadn't spoiled it. It would have been kinda like KPFA with live music and fewer pledge marathons, I suppose.

This was nonsense, of course, but it seemed Bill was the traditional whipping boy for mercenary activities which were more often instigated by his performers. In fact, Bill was generally more solicitous of his audiences than were the people onstage. Not that he ever got any credit for his generosity from either side of the proscenium. Compared to every other rock promoter I've met, worked with, or watched operate, Bill Graham was like Mother Teresa. He had a genuine affection and concern for the hapless multitudes who spun his turnstiles. And they rewarded him with blame and ingratitude.

This was partly because of his personal manner, which was raw stuff. His style so shouted the semiotics of barbarous self-interest that it was often difficult to appreciate the beauty of what he made for the thunder of what he was.

That he maintained an incredibly robust first-strike capability was certainly understandable. I expect that sometime while he was a ten-year-old fleeing the same Nazis who wiped out most of his family, he began working on a personality which would announce to the world that anyone who wanted to mess with Bill Graham would buy an unacceptable amount of trouble in doing so. Which was true. A full-on battle with Bill was no day at the beach for the fool who started it. And no contest with him was ever less than full-on.

Bill was a perfect reversal of Dale Carnegie dictum, which holds that aspiring businessmen should clothe their naked self-interest in trappings of sweet altruism. He obscured his huge generosity under aggression and hostility, but a bigger-hearted guy I've rarely met.

Continued on page 122

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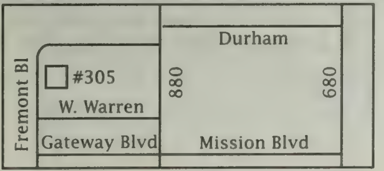

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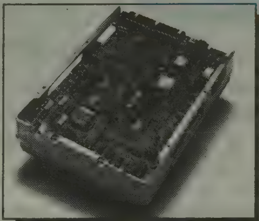

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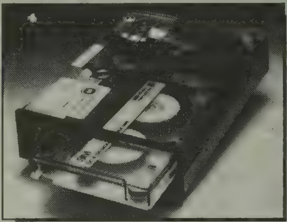

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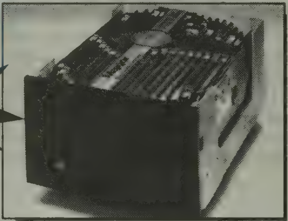

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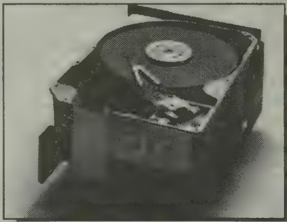

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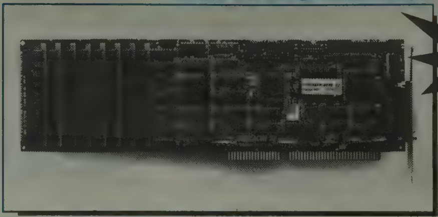

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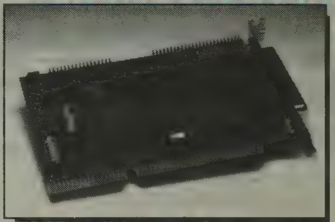

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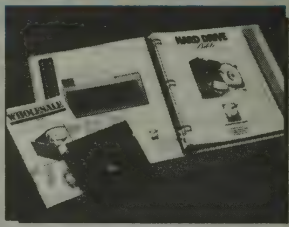

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INDUSTRY INSIGHT

New Hardware At COMDEX

BY PAUL HOFFMAN

APPLE AND LAPTOPS DOMINATE AN UNEXCITING YEAR

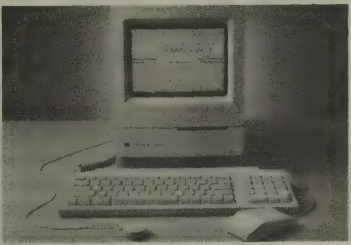
COMDEX is usually *the* show of the fall, with many manufacturers making major announcements. This year, COMDEX was partially upstaged by two other shows earlier in October that brought more serious announcements. The shows, InterOp in San Jose and Networld in Dallas, both cover networking hardware and software exclusively.

PowerBook family, 100, 140, and 170

But the networking world is moving faster than the rest of the PC world these days, so the COMDEX announcements seemed less important.

The big announcement at this year's COMDEX (you can't really call it news) was the new Macintoshes from Apple and many new pen-based computers. The software announcements of the week were not really as important as they might be because corporate users are trying desperately to decide whether to go with Windows, with Microsoft's next operating system (NT), OS/2, or to stick with MS-DOS. They spent more of their time asking about products that won't exist for a year than looking at the new products, much to the consternation of the software developers who didn't want to offend anyone.

Apple's new Macintosh computers have been widely discussed for the previous six months. Basically, they come in two flavors: lightweight notebooks and high-end systems. The notebooks, called PowerBooks, are significantly better than Apple's previous attempt at laptop computers, the misnamed Macintosh Portable. They are fairly light (5 to 7 lbs.), small, and reasonably powerful. They are comparable in computing power to the current crop of notebooks that are based on the 80386SX CPU running at 20MHz. Apple's notebooks are much more expensive than the comparable no-name clone 80386SX systems but competitive with the better-known brands.



Mac Classic II with MicroPhone

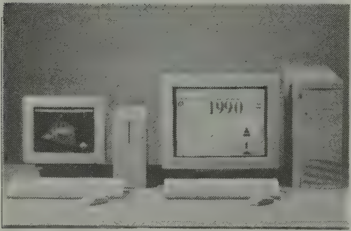
The top-of-the-line PowerBook 170 has a backlit active-matrix LCD screen comparable to that of the Mac Portable; the 100 and 140 models have lower-cost Supertwist displays. The 170 includes a built-in faxmodem. To reduce the weight and cost of the 100, Apple decided to leave out one feature common on other portables: the floppy drive. Texas Instruments is the only major PC manufacturer to offer a floppy-less portable, which has received mixed reviews. Because

> Because Apple builds networking and SCSI ports into all of its computers, the lack of a floppy drive on the 100 is not much of a disadvantage—you can just hook into a network or to another Macintosh and copy files using the Finder at fairly high speeds.

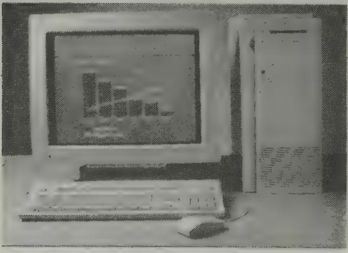
Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman @well) and MCI Mail (264-3171). He also writes popular microcomputer books.

Both Microsoft (Windows for Pen Computing) and Go (PenPoint) have delayed the introduction of their operating systems, leaving hardware manufacturers ready to sell computers but having nothing to run on them.

Apple builds networking and SCSI ports into all of its computers, the lack of a floppy drive on the 100 is not much of a disadvantage—you can just hook into a network or to another Macintosh and copy files using the Finder at fairly high speeds. Most users will find that the lack of a floppy drive is only a liability when they cannot access their main computers directly or through a modem.


Quadra 900 and Quadra 700 with monitors

The Apple Quadra machines are simply faster Macintoshes based on the 68040 CPU. They are extremely expensive and cannot use all of the power that the 68040 affords, such as advanced bus snooping. Thus, they will be used only by people who are committed to the Macintosh and must have the very fastest machines available. It's likely that companies that make add-in 68040 boards will be able to provide more cost-effective solutions consisting of less expensive Macintoshes with add-in boards.


Quadra 900 with 21" color display

The many announcements of the pen-based computers (variously called notepads, slates, pentops, and so on) were marred by the lack of operating systems available. Both Microsoft (Windows for Pen Computing) and GO (PenPoint) have delayed the introduction of their operating systems, leaving hardware manufacturers ready to sell computers but having nothing to run on them. Most of the computers use the 80386SX or 80386 CPUs, have the ability to communicate through a LAN or modem, and cost well over $3000 (some over $5000). The market was bolstered a bit by a surprise showing by IBM, but many buyers remained very skeptical about the future of pen-based computing until the prices drop far below where they are now. The needs of the vertical-market applications (insurance adjusters and salespeople, meter checkers, salespeople checking in-store inventory, and so on) can probably be met by lightweight notebooks with good software for under half the cost of a pen-based system.

NETWORKING NEWS

October is a good month for network managers, since companies have to work hard to release new products at the InterOp and Networld trade shows. This year's InterOp showed current directions for US companies with wide-area networks (WANs), moving toward optical cabling and better management software.

As its name implies, the InterOp show emphasizes software and hardware that let networks interoperate. Networld is more of a local area network show, and the products announced there are aimed mostly at network managers who don't have to worry as much about connecting dissimilar networks. However, since Networld is a much larger show, many companies preferred to make announcements there.

The biggest announcements at Networld related to upgrades to network operating systems. Banyan, the main competitor to Novell in the networking arena, announced v5 of the Vines operating system. Version 5 (finally) supports the Macintosh as a client, and has better features to help end-users connect to devices on the network. SunConnect, the Sun subsidiary that specializes in network software, announced that it will port Novell's NetWare to the Solaris v1 operating system. This will allow Sun users to interconnect to Novell systems. Although this may seem like a big step, few Sun users are expected to use the software since Solaris already supports much more advanced and easy-to-use networking than NetWare.

Microsoft upped the ante in its war with IBM by releasing LAN Manager 2.1 with better connections to other popular network operating systems—except IBM's. The new LAN Manager, one of Microsoft's only programs that requires OS/2, will work better with Apple's AppleTalk, Novell Netware, and generic TCP/IP networks. More than a year ago, Microsoft and IBM promised to make their two network operating systems work more closely, but now Microsoft has decided to renege on that promise due to the animosity between the two companies. IBM will still work on making its product, LAN Server, work with LAN Manager, but will have to do it without Microsoft's help.

SunConnect, the Sun subsidiary that specializes in network software, announced that it will port Novell's NetWare to the Solaris v1 operating system. This will allow Sun users to interconnect to Novell systems.

As an outgrowth of the Apple-IBM agreement signed earlier, Apple announced its first 16Mbit-per-second token ring adapter. The new adapter uses IBM's chip set and a flexible network cache that gives the card a high speed for most simple file transfers. Apple also announced AppleTalk Remote Access, unified system software that allows Macintosh users to dial into an AppleTalk network through a modem. Although other companies already offer such software with their modem hardware, ARAP is the first standardized software for this. The other major manufacturers, including Farallon and Shiva, announced that they would support ARAP in addition to their own protocols.

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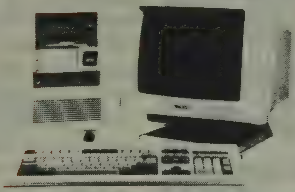

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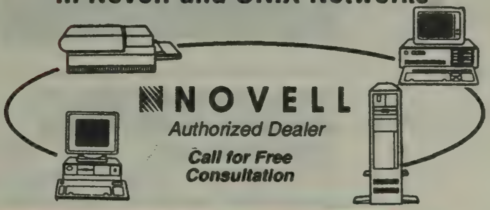

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IBM has a much tougher task with OS/2 than Microsoft has with Windows. OS/2 v2 is a major rewrite of the majority of the operating system. On top of that, IBM is relying on Microsoft to deliver timely beta copies of Windows v3.1 so that OS/2 can run Windows v3.1 programs successfully.

THE POLITICS OF BEING LATE: IBM AND MICROSOFT BLOW THEIR DEADLINES

It's not like anyone in the microcomputer industry takes deadlines seriously any more, but when the two leaders in the operating systems field, battling madly for customer support, both screw up, it's time to take notice.

Both IBM and Microsoft had long promised to have the next versions of their operating systems, OS/2 v2 and Windows v3.1, respectively, out by the end of this year. Now, both are saying "first quarter 1992," meaning that they are giving themselves three months more. Of course, they could just as easily miss those deadlines as well, and the only people hurt would be their customers.

To be fair, IBM has a much tougher task with OS/2 than Microsoft has with Windows. OS/2 v2 is a major rewrite of the majority of the operating system. On top of that, IBM is relying on Microsoft to deliver timely beta copies of Windows v3.1 so that OS/2 can run Windows v3.1 programs successfully. Microsoft, on the other hand, is only making a modest revision to Windows, mostly for better printer and network support. The upgrade to Windows v3.1 does not involve significant changes to the core of Windows, but it has proved daunting to Microsoft, so much so that it will have taken them more than a year and a half for a fairly direct change.

The bitter war between Microsoft and IBM hasn't helped either side. Microsoft knows that it has IBM over a barrel as it delays Windows 3.1, since IBM is committed to OS/2 v2 running Windows v3.1 software. Until Microsoft finalizes Windows v3.1, IBM can't be sure that their software will work correctly. Microsoft is silent on the subject of why it's taking them so long to upgrade Windows, but it shows what many power users have suspected all along: Windows is fairly fragile. These same power users are praying that OS/2 v2 proves to be more robust and stable when IBM finally releases it.

After announcing the delay, IBM showed quite a bit of class by clarifying that they would, in fact, ship this year, but only to established IBM customers who need the preliminary version. Many people in the micro industry forget that larger computer companies actually have strong relations with customers who rely on them for technology. Many IBM mainframe and minicomputer customers were relying on OS/2 v2 to hook their PCs into their corporate computers. Since much of the work in OS/2 v2 is done, IBM will ship the preliminary version to people who don't need the "seamless" Windows integration. This is particularly important to customers who are doing their own OS/2 development or want to use the OS/2 programs that are starting to come out. Microsoft has made no such announcement about Windows v3.1.

APPLE BUYS IBM SOFTWARE

Claris, Apple's software subsidiary, has taken its first step into the non-Macintosh world by buying Hollywood, IBM's new presentation graphics program for Windows. IBM recently decided to shed much of its brand-labeled PC software from its Desktop Software division, including Hollywood. The deal marks a first for IBM in selling the software to other companies. It's also the first time Claris has sold Windows programs.

Hollywood entered the already-crowded presentation market this spring to high ratings and good reviews. It fills a gap in the Claris software line, since Claris doesn't have a presentation package for the Mac. It's unlikely that Claris will try to convert Hollywood to the Macintosh platform, although they said that they would port it to OS/2 v2.

Given that Microsoft totally dominates the Windows applications market with Excel and Word for Windows, and given that Microsoft now disdains anything that even sounds like OS/2, Claris/Apple could make the interesting move of coming out early with strong OS/2 products.

The software industry has long wondered when Claris/Apple would get into the Windows market. There are strong rumors that Claris has been working on Windows versions of some of its popular Macintosh programs, including FileMaker Pro and MacWrite II. These rumors have taken different forms, particularly when Claris started advertising for programmers familiar with Windows and OS/2.

Given that Microsoft totally dominates the Windows applications market with Excel and Word for Windows, and given that Microsoft now disdains anything that even sounds like OS/2, Claris/Apple could make the interesting move of coming out early with strong OS/2 products. Without Microsoft in the market, they might be able to become the market leader if OS/2 v2 takes off. Even if it doesn't, Apple would certainly ingratiate itself to IBM by supporting OS/2 over Windows. ■

Continued on page 255

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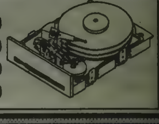

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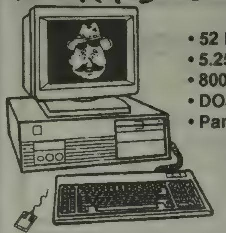

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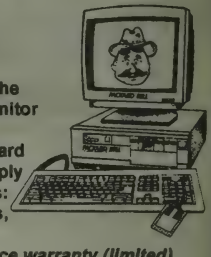

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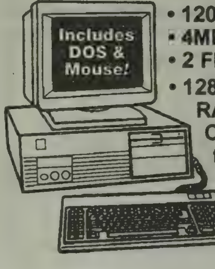
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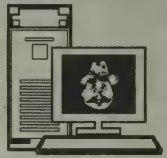

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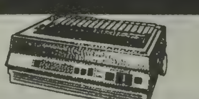

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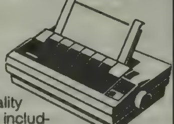

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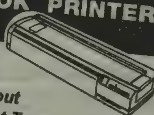

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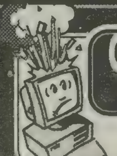

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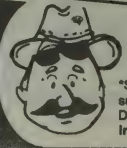

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Who Are You Talking To?

And Who's Listening?

BY JIM WARREN

REALIZABLE FANTASIES

What if you recorded every word you said in most phone conversations, and they were automatically typed into a computer? Then searches could easily be automated for any topic or word or phrase you may have mentioned.

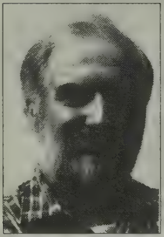
What if they were saved for years? What if most of your private, confidential, informal, candid, off-the-cuff business conversations, job gossip, and even your highly personal discussions with close friends were permanently identified as your comments and stored in this easy-to-search form, instead of evaporating when your voice stopped reverberating?

Getting nervous yet?

What if the computer where years of your comments were stored wasn't under your control? It might be a company computer where your computer-aided boss could review your confidential conversations. And—lest surveillance-minded bosses view this too favorably—note that they, also, have overseers—shareholders, tax auditors, unending government agencies, etc. Further: What if the computer wasn't even under company control? And curious eaves-droppers could monitor and search from the comfort of their home or office—perhaps internationally.

What if contingency-based litigation attorneys could automatically search through every one of your conversations—and those of your staff—to discover any ill-considered comment that you or anyone else may have ever made—and then use it to extort money from you or your company?

Could you survive such surveillance? Could your job? Could your company?



Copyright © 1991 by Jim Warren, 345 Swett Rd., Woodside, CA 94062. All rights reserved. Jim Warren founded InfoWorld, *the DataCast proposal for paperless electronic newspapers, Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS's* Computer Chronicles, *founding editor of* Dr. Dobb's Journal, *and has chaired various computer professionals' organizations. He holds graduate degrees in computing (Stanford, before the tax-paid overhead ripoff), medical information science (UC Medical Center), and mathematics. He is also a member of the Board of Directors of Autodesk, Inc.*

He organized and chaired the recent First Conference on Computers, Freedom & Privacy, sponsored by a dozen nonprofit and industry organizations, and is currently chairing Autodesk's CEO-Search Committee.

MAJOR NATIONAL SECURITY THREAT

Short of nuclear attack, this may be the greatest danger that high technology poses to a free people—a clear danger, present now.

The preceding scenario is exactly the situation with almost all electronic mail—and use of email is escalating at a rate far exceeding the explosion of personal computing that began in the mid-'70s.

If email passes through a file server or host computer, more than likely a copy is permanently retained—at the least, on the backup tapes that are essential for any reliable system operation. This is especially true for any commercial system that purports to be reliable—such as Prodigy, MCI Mail, CompuServe, etc. Even decades ago, when tape storage was far less dense and far more expensive, commercial time-sharing systems usually copied all files onto nightly backup tapes, and week's-end or month's-end tapes were often retained for years, at least.

Easy retrieval of an individual's deleted files has long been an additional valuable benefit of such backup systems, especially useful to fleet-fingered users who too quickly stroked the delete key. But retrieval of your files for someone else's review—and possible use against you—is just as easy.

Email to or from you may pass through a proprietary network—or Fidonet, the Internet, or other networks that have numerous independent-but-cooperating host computers. In both proprietary and public networks, system administrators all along the transmission path can usually access your email as it passes through their system. Among other things, sysops *need* essentially unlimited ability to access files—including email files—so they can maintain their systems, trace and fix problems, and occasionally assist delete-prone users.

USED LIKE A PHONE, BUT STORED LIKE A COURT RECORD

Most of us who use email think of it as confidential, use it like a telephone, and "speak" with the candor typical of lunchroom—or bedroom—gossip. That's how it should be, if we are to gain the massive benefits possible through computer-based communications—benefits that far exceed those of the telephone or the Pony Express.

But most current email systems also involve orders of magnitude greater danger for the users than if they were telephones "merely" having permanent wiretaps and tape recorders. Email permits any-

If email passes through a file server or host computer, more than likely a copy is permanently retained—at the least, on the backup tapes that are essential for any reliable system operation. Remember how Iran-Contra investigators obtained major evidence against North and Poindexter by reviewing backup tapes that retained copies of their "deleted" email?

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one who can gain access to the files to conduct automated surveillance and searches by topic or "speaker"—even through years of "recordings." And access can be obtained by operator permission, court order, or illegal electronic entry.

Contingency-fee attorneys are rapidly expanding their use of email "discovery" in shareholder litigation, wrongful termination suits, harassment allegations, etc. It's big-bucks business and your every keystroke is fair game for these hunters. Improper or ill-phrased comments that would be momentary and often forgotten if spoken on the phone can be damning when permanently stored in email and provocatively exposed to a naive jury.

DEFEND IT OR LOSE IT

The greatly enhanced utility and power of email must be counterbalanced by a greatly enhanced prohibition against its access and abuse by others—limited perhaps only to the most serious of criminal investigations. (Remember that Iran-Contra investigators obtained major evidence against North and Poindexter by reviewing backup tapes that retained copies of their "deleted" email.)

Laws can protect us against lawyers. But the best protection that individuals and companies can provide for themselves and their private communications is to encrypt *all* communications. That requires agreeing on a crypto-system, and public-key cryptography is recognized as the safest and most useful system currently available. To avoid the possibility of a hidden back door, we need a public-key implementation with program code and complete algorithm design available for public review. The government's current and proposed crypto standards fail this essential test—among others.

QUICKIES

•Tens of thousands of well-educated parents are turning to home-schooling for their children. Scattered throughout the nation, they are often using computer-based forums to exchange ideas and enthusiasm. But most such forums are currently on commercial systems such as CompuServe. Who will lead the way to implementing home-school discussions via internationally networked home computers and BBSes?

•Not exactly high-tech, but a cleansing fantasy: Why do toilet paper makers insist on using expensive, dangerous, polluting, toxic chemicals to bleach toilet paper white—instead of leaving it tan or brown in color? Which paper maker will be The Great Innovator—the first to spend its bleach money on an advertising blitz telling the world how wonderful "natural-colored" toilet paper is—and how wonderful they are for reducing pollution? Once the trend is established, the loot they used to pour down their chemical drain for others to drink can go to shareholders. (Based on comments in the September '91 *Consumer Reports*, which, incidentally, reviewed some PC-compatible printers as well as toilet paper.)

SHARE WHERE? SHARE HERE!

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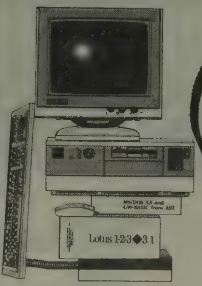

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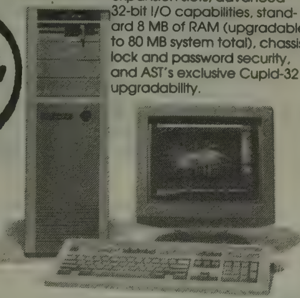

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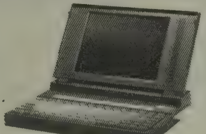

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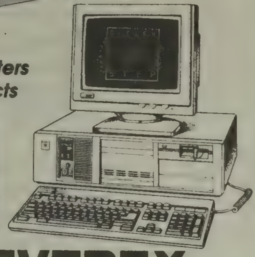

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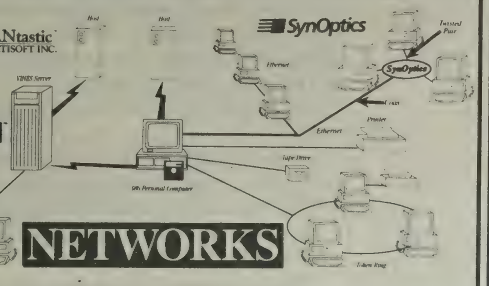

An OS Carol

(With Apologies To Charles Dickens)

BY JOHN WHARTON

Disclaimer: This is a work of fiction. Any resemblance to real events, products, or persons is purely coincidental.

The CEO's mood matched the foul Seattle weather as he left his office. Granted, company sales and profits had reached record highs—the toads in finance were still running the exact numbers—and his own net worth was pushing five billion on paper. Not bad for a 36-year-old dropout. But his biggest former customers were now all plotting against him—after all he'd done for them!—and the press was starting to turn nasty. "Just wait 'til the new year," he thought to himself. He already had plans to exact his revenge...

"Good afternoon, sir, and a very merry Christmas!"

The CEO looked up to see a fresh-faced employee arriving to start the evening shift. "R. Cratchit," his badge said. Must be a new guy in finance, the CEO thought. He'd given all the other departments Christmas Eve off. "Bah, Humbug!" the CEO muttered, and walked on.

As he walked, a hollow voice cut through the northwest wind, and a bearded Scottish nobleman appeared in the CEO's path. It looked like—was it?—could it really be *him*? It *looked* like Kildall, but he'd disappeared years ago, seven, to be exact. Sure, there'd been rumors of sightings near Monterey, but everyone just assumed Kildall was dead.

"...*William*..." the voice whispered. "You've done much to impede the industry you claim to lead. I'm here to warn you, to show you the error of your ways. Before morning's dawn you shall see three visions. Do not shun them! You can save your business still, if you choose to, if you try." And with that, the specter vanished.

THE FIRST OF THE THREE SPIRITS

That night, as he watched *Return to the Blue Lagoon* on cable, a power glitch disrupted the CEO's home multimedia entertainment center. When the system rebooted, instead of the idyllic beaches of Fiji, the video monitor showed a scene of a modestly appointed executive board room. A meeting was in progress, with half a dozen engineers circling a table. The film was set in the early '80s, the CEO guessed, based on the actors' hair styles and clothing. At the head of the table sat a nerdy-looking boy.

"But we *have* to ship this month," the boy shouted. "It's in the contract!"

"But we can't, Bill!" a software type responded. "It's not just that we're not done, it's more fundamental than that. The whole concept is flawed! It was designed in the spirit of operating systems of the past! Half the functions we need were left out, and without them, the product is brain damaged!"

"What do you mean?" the boy shot back. "Didn't we buy rights to the whole OS?"

"Yes, but the only CP/M functions they even *tried* to clone were the ones in release 1.7, not 2.2. It's not an operating system, it's a toy. We'll be lucky if it works at all. We're maintaining source code now on three different machines, written in three different assembly languages, with three different syntaxes. It takes a whole day just to build each new test version, and we have to patch in the branch addresses by hand. We never know for sure if we caught them all, and even if we did, the system just isn't right for this machine. It's single-threaded, it's hardware dependent, it can't manage memory, and it doesn't even start to use the CPU effectively..."

"It doesn't *have* to be *good*," the boy shrieked. "It just has to be *done!* If you idiots can't get it out the door by Friday, I'll take it home and finish it up myself. I'll write it all in *BASIC*, if I have to, but it'll be your jobs if we don't ship on time!"

The CEO frowned and shut off the TV. Something about the scene struck a familiar chord, but he couldn't place what. In any case, it was too much like the hassles he faced every day at work to be fun. Christmas Eve, and nothing good on the tube. Off the CEO went to bed.

THE SECOND OF THE THREE SPIRITS

Just as he began to doze off, there came a pounding at the door, and a stranger entered, dressed all in white—layer upon layer of program listings, it appeared, wrapped in chains of paper tape. "Who are you?" the CEO shouted. "How did you get in, and what do you want?"

"I am the Ghost of Operating Systems Present," the figure replied. "I've come to show you how your workers spend Christmas, while you lie in your warm bed. Come, William, look outside."

The CEO arose and walked to the window, but what he saw outside was his company's parking lot. A figure his own size was leaving the building, just as he had done that very afternoon. He could hear footsteps approach.

"Good afternoon, sir, and a very merry Christmas!" he heard. It *was* him, and that Cratchit toad from finance. The apparition carried the CEO out through the window, and they followed Cratchit into the building and down the hall to his office. Cratchit set down his coat and picked up a ringing telephone.

"Hello? Oh, hi, dear...Merry Christmas to you, too...No, not quite. I've still got one finance report, but it's nearly done. The text is finished, I just have to paste in some figures...Not long, maybe another hour...I love *you*, too, dear."

The desk clock read 4:00, but the digits began to count faster and faster, until the hours were flying by. Outside, the sky darkened, and a full moon rose overhead. The clock slowed to a stop at 11:00 pm, and the phone again began to ring.

"Yes, yes, dear, I'm okay...Sorry, no, I didn't know how late it was...No, it's not going well. All the information is on other machines. When I start the TOPS network, Windows 3.0 crashes. I gotta reboot under DOS to retrieve the data, then reload Windows. And the data formats are all different. The spreadsheets were done under OS/2, and the figures use AutoCAD 386, but that conflicts with my DOS

Continued on page 257

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EXCEL EISA 33MHz 486

w/256KB Cache

- **120 MB H/D**
- **4 MB RAM**

On-board, expandable to 64 MB

- 1.2 or 1.44 MB Floppy Drive
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- Real Time Clock
- 250W Power Supply
- Vertical case holds 6 drives
- Supports MS-DOS, OS/2, PC MOS/386, UNIX, XENIX, Dr. DOS, Concurrent DOS 386

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HD	MONO 14"	Super VGA Color 1024x768	Super VGA 1024x768 Non-Interlaced
120MB	$2,495	$2,795	$2,998
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intel inside

EXCEL ISA 33MHz 486

w/128KB Cache

- Landmark Speed = 165
- **105 MB H/D** (16ms)
- 1 MB RAM On-board, Expandable to 32 MB
- 1.2 or 1.44 MB Floppy Drive
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- Real Time Clock
- 230W Power Supply
- Vertical case holds 6 drives
- Supports MS-DOS, OS/2, PC MOS/386, UNIX, XENIX, Dr. DOS, Concurrent DOS 386

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105MB	$1,898	$1,635	$1,775
120MB	$1,425	$1,669	$1,805
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EXCEL 40MHz 386

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- 1.2 or 1.44 MB Floppy Drive
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- Real Time Clock
- 230W Power Supply
- Vertical case holds 6 drives
- Supports MS-DOS, OS/2, PC MOS/386, UNIX, XENIX, Dr. DOS, Concurrent DOS 386

$789

40MHz HD	MONO 14"	Super VGA Color 1024x768	Super VGA 1024x768 Non-Interlaced
40MB	$889	$1,079	$1,139
105MB	$1,039	$1,125	$1,275
120MB	$1,065	$1,265	$1,325

EXCEL 33 MHz 386

w/64K CACHE

$755

- Landmark Speed = 56 SI = 41
- 1 MB RAM Expandable to 32 MB;
- Socket for 80387 & Weitek Math Co-Processor
- 1x32 Bit, 5x16 Bit, 2x8 Bit Slots
- Real Time Clock/CMOS Memory w/Battery Backup
- 1.2 or 1.44 MB Floppy Drive
- **40 MB H/D**
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- 230W P/S Syst. Case Holds 5 Drives
- 101 Key Enhanced Keyboard

HD	MONO	VGA Color	Super VGA 1024x768
40MB	$855	$1,045	$1,099
105MB	$998	$1,185	$1,245
120MB	$1,025	$1,215	$1,295

EXCEL 25MHz 386

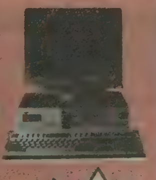
- Landmark Speed = 34.5 SI = 29.5 (w/Memory Interleave)
- 1 MB RAM Expandable to 8 MB On-Board
- Socket for 80387
- 1x32 Bit, 5x16 Bit, 2x8 Bit Slots
- Real Time Clock/CMOS Memory w/Battery Backup
- 1.2 or 1.44 MB Floppy Drive
- **40 MB H/D**
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- 230W Power Supply & Case Holds 5 Drives
- 101 Key Enhanced Keyboard

$655

HD	MONO	VGA Color	Super VGA 1024x768
40MB	$755	$948	$1,015
105MB	$898	$1,098	$1,158
120MB	$949	$1,145	$1,194

EXCEL 16MHz 386SX

- Landmark Speed = 22 SI=21
- 1 MB RAM On Board Expandable to 8 MB
- 1.2 or 1.44 MB Floppy Drive
- **40 MB H/D**
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- 101 Key Enhanced Keyboard
- 200W Power Supply & Case Holds 5 Drives
- Real Time Clock W/Battery Backup
- Socket For 80387SX



$569

HD	MONO	VGA Color	Super VGA 1024x768
40MB	$669	$865	$915
105MB	$815	$998	$1,059
120MB	$855	$1,045	$1,095

System Board:

386SX-16MHz	$195
386-25 MHz	$345
386-40 w/64K Cache	$415
386-33 w/64K Cache	$399
486-33 w/128K Cache	$795
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Drives:

SONY CD ROM	$395
TEAC 1.2 MB	$59
TEAC 1.44 MB	$59
40 MB H/D	$185
80 MB H/D	$275
105 MB H/D	$315
120 MB H/D	$345
200 MB H/D	$565
320 MB H/D	$1,135
120 MB Tape Backup Dr	$295
250 MB Tape Backup Dr.	$395

Other:

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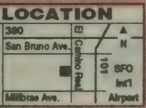

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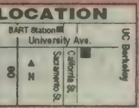

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✓ PostScript® & HP LaserJet II compatible!

The LX-29000 comes with 35 typefaces and uses Microsoft's TrueImage for full compatibility with PostScript, the professional standard for graphics and typesetting. It accepts Adobe Type 1 and 3 fonts as well as TrueType fonts. It works great with Windows 3.X, Apple System 7 and all Mac and PC software that supports PostScript or TrueImage printing. And its HP emulation easily handles non-PostScript printing.

✓ Uses Canon's dependable LX engine

The LX-29000 uses the same lightweight, small-footprint, 300 dpi, 4 ppm Canon LX engine used by HP, Apple and QMS, so supplies and service are never a problem. And Canon's patented all-in-one cartridge eliminates all that toner mess.

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Prints from your IBM PC or Macintosh via Centronics, RS-232C or AppleTalk interfaces. Interface selection is automatic. The LX-29000 comes with 2 megabytes RAM, a universal paper tray and a toner cartridge.

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✓ Paper Feeders and Trays

250-sheet paper feeder
Installs beneath the LX-29000 or any Canon LX engine printer. The letter tray (included) provides up to 250 sheet capacity. The feeder also allows dual bin operation with the existing LX-29000 paper tray. Additional paper trays are available for Legal size and envelopes.
$159.95

Envelope tray
Holds 20 envelopes. Requires paper feeder (sold above).
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Holds 250 sheets of 8.5 x 14" paper. Requires paper feeder (sold above).
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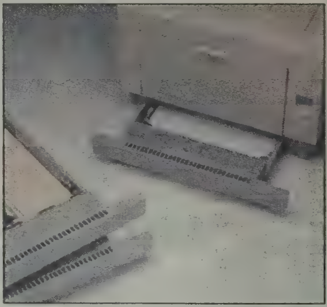

✓ Supplies

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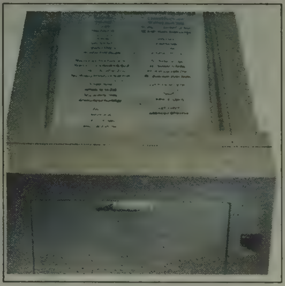

If you've been waiting for just the right combination of speed, PostScript® compatibility and price to buy a new laser printer, wait no more! Introducing the new LX-29000™ from The Printer Works!

Printer	Font Benchmark (sec.)	Engine Manu.	Actual Wt.	All-in-one toner cartridge	Toner & drum cost	Street price
LX-29000	66	Canon	26	Yes	$79	$1295
GCC BLP Elite	225	OKI	24	No	$268	$1495
NEC Silentwriter II Model 90	213	Minolta	44	Yes	$209	$1595
QMS-PS 410	106	Canon	26	Yes	$79	$1925
QMS-PS 810 Turbo	99	Canon	44	Yes	$89	$3995
Apple Personal LaserWriter NT	165	Canon	30	Yes	$89	$1995
HP LaserJet IIP w/ Adobe cartridge	213	Canon	26	Yes	$89	$1525

OPTIONAL ACCESSORIES FOR THE LX-29000

✓ Cables

AppleTalk kit (DIN 8)
Connects an AppleTalk compatible printer (such as the LX-29000) to an existing AppleTalk network. Includes 12' phone cable.
$19.95

AppleTalk kit (DB9)
As above but for use with earlier Macintosh models with DB9 printer port.
$19.95

IBM Centronics cable
12-foot cable connects a Centronics compatible printer to a parallel port on an IBM PC or compatible computer.
$9.95

AppleTalk Cable
12-foot cable connects one Macintosh computer to one printer.
$12.95

✓ Fonts

Casady & Green Fluent Fonts (PC Version)
81 original Adobe Type 1 compatible fonts. Includes Adobe Type Manager (ATM) for Windows 3.0, plus installation software for WordPerfect and Microsoft Works for DOS.
$109
Mac Version $109

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GE Computer Service

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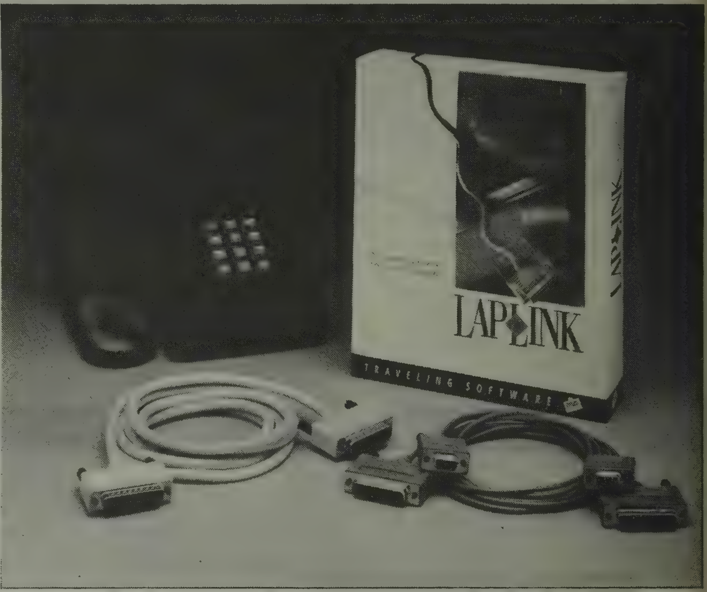
The Latest & Greatest Transfer Utility

LapLink Pro Steals The Show For Transferring Files From Your Notebook To Another Computer

BY ED KAHN

There is no doubt that while the number of people using laptops as their only computer is growing by leaps and bounds, there are still many users of portables who use them in conjunction with a desktop machine. I love the little computers, but nevertheless rely on my desktop machine for the lion's share of my work. For me, the beauty of the notebook computer is that I can take files with me and then transfer the modified data back to my desktop when I return to my home office.

Over the years there have been at least a half dozen contenders for the number one spot in the file transfer utility market. But the winner has always been Traveling Software's LapLink. Although it has been the most widely accepted transfer utility, it has not necessarily been the best. There were individual features in competing products that I personally preferred, but nevertheless, like so many others, I stayed with LapLink through all of its releases because, overall, it suited my needs best.



Now Traveling Software has come out with LapLink Pro, a new and completely revised version of its software. They have stolen all the thunder from the competition to produce a product that does all you could want in this class of software.

LapLink Pro works by connecting two computers together with either a serial or parallel cable, and then invoking the software on both machines. The 8' serial cable, redesigned by Traveling Software, accommodates any combination of either nine- or twenty-five-pin ports. The new parallel cable allows a faster transfer rate than before. But the most important change in connecting computers is the ability of the new software to automatically detect which port is being used.

Although it was usually a simple matter to tell the old software which port was being used, in fact, the automatic detection is a great convenience. Many times in the past, I have connected two computers together only to find that the systems were not communicating. I would end up changing the port selection several times before transfering the files. On many portables, the ports on the back of the computer are not identified, making it difficult to know just which serial port address has been assigned to a particular port. With the new software, all you do is plug the appropriate cable into the ports on each machine. This is pretty foolproof, as you cannot easily plug a serial cable into a parallel port.

Once the computers are connected, you simply call up the program on each machine. Each will display a split screen listing both sets of directories. If you are connecting to a machine that does not have the program, you can clone it if you are using serial ports. (The parallel connection offers a faster transfer rate, but you cannot clone through that port.) Instructions on-screen guide you through the simple cloning process. Once you have the program installed on both machines, the rest is a breeze. If you are ever in doubt, just hit F1 and context-sensitive help appears. If you play around with the program for a few minutes, calling for help when you are not clear about what to do, you will find the program simple, powerful, and intuitive.

The old version of LapLink actually let you do everything you needed to do, but I always wished a few operations were easier to accomplish. Now they are. For instance, if you have a subdirectory on each of the two computers and files have been modified in each, a new command allows you to synchronize the two subdirectories, automatically picking the newer version of all files regardless of which computer it is on. This is definitely a time saver. This command makes

RESOURCES:

LapLink Pro, $169.95
Traveling Software
18702 North Creek
Parkway
Bothell, WA 98011
800-343-8080

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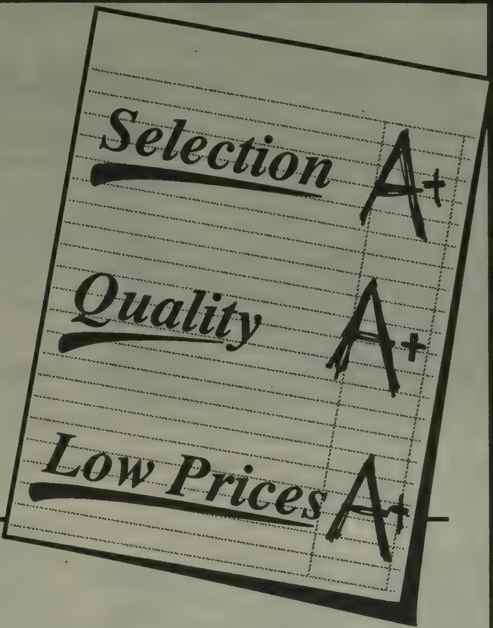
When it comes to notebooks, WINNERS CIRCLE SYSTEMS makes the grade!



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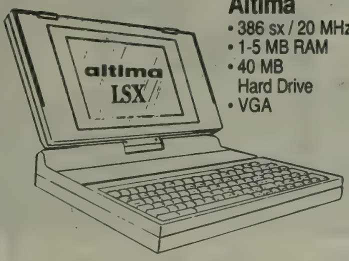

Altima
- 386 sx / 20 MHz
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- 386 sx
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- VGA Screen

Arche NP 101
- 386 sx / 16 MHz
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- 20 MB Hard Drive
- VGA Screen

Sanyo 17 Notebook
- 1 MB RAM
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- VGA Screen
- 286/ 12 MHz

Commodore
- C386 sx / 16 MHz
- 1 MB RAM upgradable to 5
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Aquiline 386/33
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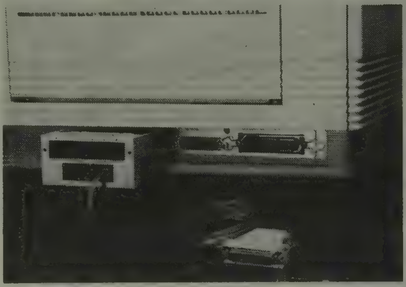
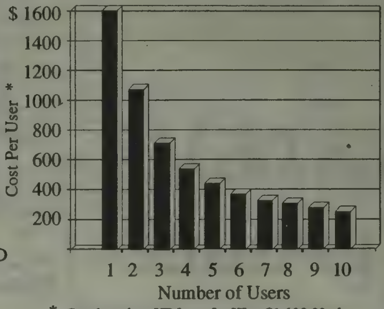


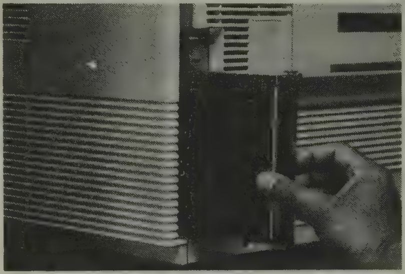
JetCard

- Up to 10 users share HP LaserJet III, IIID, II, IID
- Plugs into "Optional I/O" slot
- 256 KB buffer upgradeable to 1 MB

SHARING MAKES SENSE :
See for yourself, why printer sharing makes sense to thousands of our world wide customers.

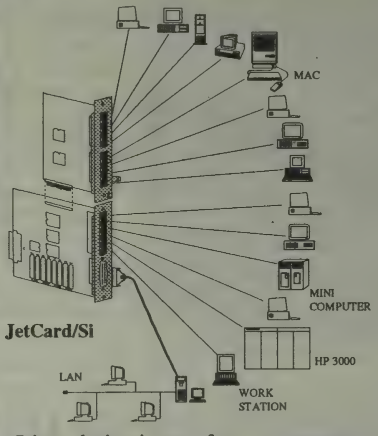


* Cost based on HP LaserJet III at $1,600.00 plus cost of JetCard and accessories.

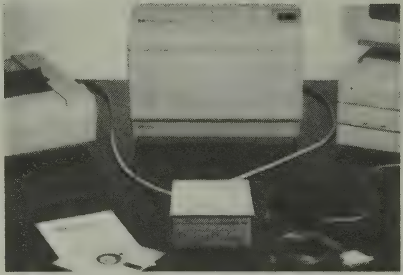


JetCard/Si

- Up to 15 users share HP LaserJet IIISi
- Plugs into modular I/O (MIO) slot
- 1 MB buffer upgradeable to 4 MB



Printer sharing is easy, from any computer.



PrintPoint

- Up to 10 users share any 2 parallel printers
- Compact, stand alone desk top models
- 256 KB buffer upgradeable to 1 MB

"Excellink's PrintPoint ... offers what is arguably the simplest possible approach to printer sharing. You won't find a complicated set up procedure.... You will find spartan simplicity and generally top flight test scores."

PC MAGAZINE

- **M. David Stone,** ***Editor***
PC Magazine, April 30, 1991

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the two directories identical.

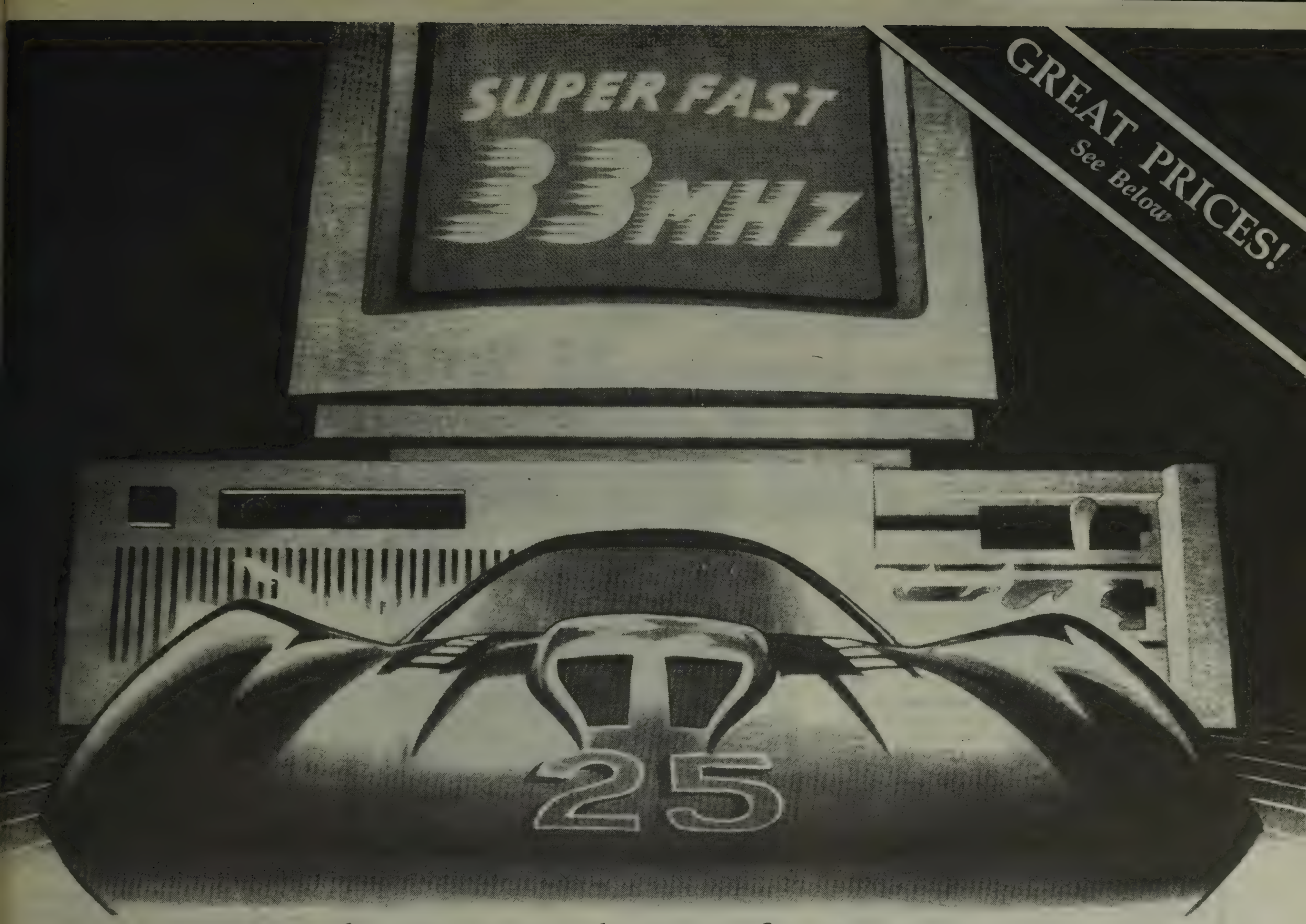
Another addition is a simple text editor. In the earlier version, you could view files, but, annoyingly, you had to leave the program in order to modify them. Now you can edit files from within the program.

The entire look and feel of the program is new, with pull-down menus and dialog boxes. It's easy to get around in the new program. I was able to accomplish everything I needed to do without referring to the documentation. In the end, I read the manual and found strengths to the program that I had not seen on my own. For instance, one of the new features is the ability to use the program through a modem.

The procedure for connecting two computers over a modem is a bit more complicated and in fact nearly requires that you have two phone lines: one for the modem and one for voice communication between the two operators. This is not a program designed for remote access to another computer, but it is definitely a useful feature when you need to coordinate two computers at distant locations. Keep in mind, however, that modem transfers are considerably slower than hard-wired transfer. LapLink Pro has a data compression feature that compresses files before transfer and decompresses them before installation on the second machine. This speeds up transfers, especially when you are using a modem.

There are many wonderful features to this transfer utility, but, stated simply, if you have the need to transfer files from a portable to another machine, this is the program to get. This program has come of age. ■

LapLink Pro has a simple text editor. In the earlier version, you could view files, but, annoyingly, you had to leave the program in order to modify them. Now you can edit files from within the program.



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- 385-33MHz CACHE controller
- 4MB RAM memory
- 1.2MB Teac floppy drive
- 200MB Fast Hard Drive 15(ms)
- Serial/Parallel port
- Enhanced keyboard
- 386-40MHz: add $50

- BASIC SYSTEM: $1295
- S VGA SYSTEM: $1695
- SH VGA SYSTEM: $2095

MICRO 386-25MHz

- 386-25MHz CPU, 32 bit
- 4MB RAM memory
- 1.2MB Teac floppy disk drive
- 84MB Fast hard drive 18(ms)
- Serial/Parallel port
- Enhanced keyboard
- 64K cache option

- BASIC SYSTEM: $1095
- S VGA SYSTEM: $1495
- SH VGA SYSTEM: $1895

MICRO CACHE 486-33MHz

- 80486-33MHz 64K cache
- 4MB RAM memory
- Hard/Floppy disk controller
- 1.2MB Teac floppy drive
- 125MB fast hard drive 18(ms)
- Serial/Parallel port
- Enhanced keyboard
- 486-33MHz EISA option
- BASIC SYSTEM: $1495
- S VGA SYSTEM: $1895
- SH VGA SYSTEM: $2295

WEEKLY SPECIALS

A. 386 SX, 25MHz,
1MB (80ns) RAM, 1.2MB Floppy Drive, 42MB Hard Drive 18(ms)
BASIC SYSTEM: $695
S VGA SYSTEM: $1095

B. Micro 486SX-20MHz
90MHz Performance, 1MB RAM, 1.2MB Floppy Drive, 84MB Hard Disk Drive 18(ms), Enhanced Keyboard,
BASIC SYSTEM: $895
S VGA SYSTEM: $1295

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• Seiko VGA Monitor (1024x768) 14"	$ 479
• S VGA Monitor (1024x768) 14"	$ 299
• Paradise VGA 1024i card (1024x768)	$ 199
• Seiko 1450 NI Monitor + Orchid ProDesigner II w/ 1MB	$ 699
• Micro 386SX-16MHz Motherboard	$ 199
• Micro 386SX-25MHz Motherboard	$ 299
• Micro 386-25MHz Motherboard	$ 399
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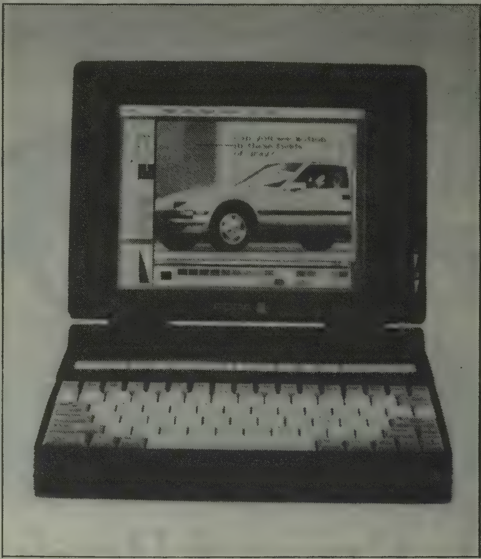
Computer Of The Month:

Fora's NBX-386S/25 Notebook



The notebook is the fastest moving segment of an already fast-paced computer industry. With the achievement of reasonably small-sized notebooks, the push these days is for longer battery life and greater energy efficiency. For years, Intel had the 386 chip market pretty much to itself. But now Advanced Micro Devices is making major inroads and promises to accelerate the trend with the introduction of new energy efficient chips.

Fora's NBX-386S/25 is built around AMD's 25MHz SXL chip. One advantage of this chip is that it draws 35% less power than a conventional 386. Another is that the microprocessor can be put into a standby mode in which the clock is stopped and the processor consumes virtually no electricity. This allows you to let the computer enter a sleep mode and return to full operation with the touch of a key.

Fora's notebook computer can run for up to eight hours by using the built-in rechargeable NiCad battery plus the optional add-on battery ($175), which adds an additional 2lbs. to the 6lb. package. In addition, you can power the system with the included AC adapter that also recharges the NiCad batteries.

Although this computer comes in a small package, it packs a lot of power. It comes standard with 4MB of RAM, expandable to 8MB. It also has a 60MB hard disk. An 80MB model is available for an extra $200.

The system has an exceptionally clear, paper white, VGA display that measures 10" diagonally and supports thirty-two gray scales. If you want color, it is easy to attach a color monitor through the VGA port which supports Super VGA display.

They keyboard layout is the weakest part of the unit. While there is a full 81-key keyboard, it's necessary to use a Fn key, in addition to cursor movements, to get PgUp, PgDn, Home, and End. I find this cumbersome. Most of the notebook computers have gotten away from this design as it is particularly awkward for writers. Fortunately, however, it is possible to attach a keyboard of your choice through the keyboard/keypad port.

While Fora has provided only one serial port, they do offer an optional internal fax/modem ($395), so you can use both a modem and a mouse. With the popularity of Windows, it is essential that manufacturers provide either two serial ports or the option of a built-in modem. There is also a single parallel port, but it is set up a bit differently than most. Rather than the standard twenty-five-pin parallel port, they use a mini port that takes up less space. A pigtail adapter is provided that plugs into the mini port and then provides a standard twenty-five-pin port on the other end. It all works fine, but you have to be sure to have the pigtail with you or you will not be able to connect to a printer. This port can also accommodate an external disk drive.

This is a powerful computer that represents a new step forward in technology. If you need a fast notebook computer that offers long battery life, this model is definitely worth considering. ■

RESOURCES:

NBX-386S/25, $2995
Fora Incorporated
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San Jose, CA 95134
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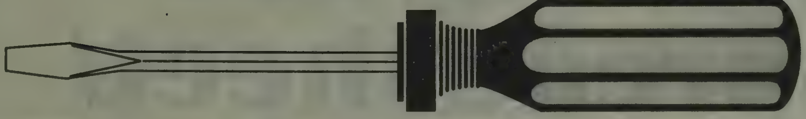

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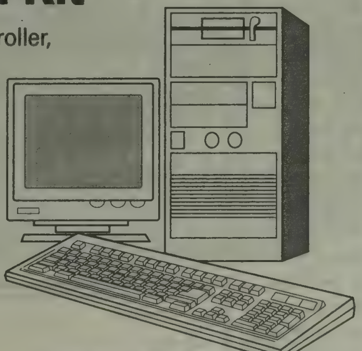

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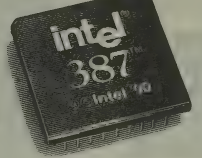

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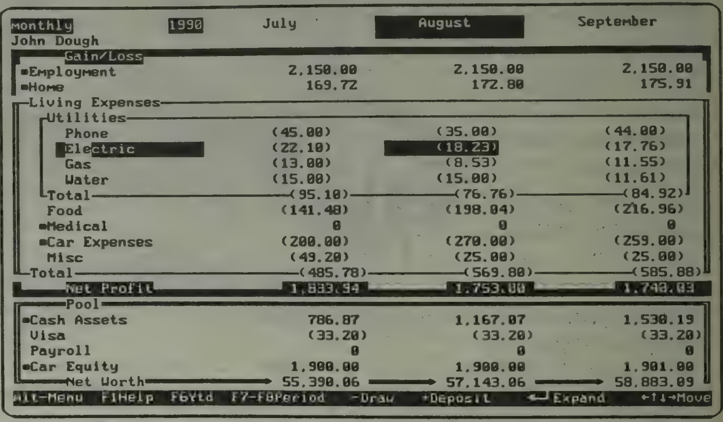
Closing The Spreadsheet/ Checkbook Split

TreeBased Financial Software Links Your Bookkeeping With Financial Analysis And Planning

BY ANNA COUEY AND THOMAS SCHLEGEL

Have you ever been frustrated because your spreadsheet doesn't automatically reflect daily bookkeeping entries?—Or with your checkbook program because you want to quickly evaluate two different month's financial statements? Ever want to compare actuals with budget amounts with a keystroke? Do you wonder why spreadsheet and checkbook programs are so often two separate things, despite the fact that budgets, analysis, and daily bookkeeping are integrally interrelated?



```
Monthly             1990      July              August             September
John Dough
  Gain/Loss
■Employment                 2,150.00           2,150.00            2,150.00
■Home                         169.72             172.80              175.91
 Living Expenses
  Utilities
    Phone                   (45.00)            (35.00)             (44.00)
    Electric                (22.10)            (18.23)             (17.76)
    Gas                     (13.00)             (8.53)             (11.55)
    Water                   (15.00)            (15.00)             (11.61)
  Total                     (95.10)            (76.76)             (84.92)
  Food                     (141.48)           (198.04)            (216.96)
 ■Medical                         0                  0                   0
 ■Car Expenses             (200.00)           (270.00)            (259.00)
  Misc                      (49.20)            (25.00)             (25.00)
 Total                     (485.78)           (569.80)            (585.88)
     Net Profit            1,833.94           1,753.00            1,740.03
     Pool
■Cash Assets                 786.87           1,167.07            1,530.19
 Visa                       (33.20)            (33.20)             (33.20)
 Payroll                          0                  0                   0
■Car Equity                1,900.00           1,900.00            1,901.00
     Net Worth ─────────> 55,390.06 ───────> 57,143.06 ───────> 58,883.09
```

Alt-Menu F1Help F6Ytd F7-F8Period -Draw +Deposit ↵Expand ←↑↓→Move

TreeBased's Main Worksheet displays three months' actuals: General categories can be expanded into subcategories, which can be further expanded into accounts, where you can enter transactions.

There are ways to work around this spreadsheet/checkbook split. You can import files, or write macros to link together different spreadsheets, or print a multiplicity of reports from your checkbook program and compare the printouts. But, these methods are by no means effortless. And for something as critical as financial management, where current and accurate information can make the difference between disaster and success, it'd be convenient to have one program that links bookkeeping with analysis and planning.

TreeBased Financial Software is one program that attempts to combine the spreadsheet and checkbook models for computerized accounting. Based on the model of a branched worksheet, TreeBased essentially makes your spreadsheets representative of each transaction. Its outermost layer, or trunk, is a profit/loss statement, from which categories can be expanded to subcategories, to accounts, and from there to specific transactions, which are entered as deposit or draw vouchers. The Main Worksheet shows actuals for three months at a time onscreen, and you can shift to prior or future periods with a keystroke. You can also set the worksheet to display actual versus budget amounts. Nice! So, how effective is it? Does it really do away with multiple financial programs? To find out, I spoke to two TreeBased users, who use it in divergent ways.

Despite the fact that John Jensen describes himself as having little computer and accounting experience, he found TreeBased to be very easy to use. He says he just took it out of the package and began to run it. Now he pushes TreeBased to its limits, keeping track of hundreds of accounts.

INVENTORY, BUDGETS, AND ANALYSIS

John F. Jensen is a retired AT&T manager, but certainly not inactive. One of his projects is the distribution of Spyderco knives. When I called, he was running TreeBased. Jensen uses the program to keep track of both his personal finances, and those of his knife distribution

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Anna Couey (couey@well.sf.ca.us) is a writer and artist, specializing in creative use of new communication technologies. She's a (former) business manager. Thomas Schlegel (thansen@well.sf.us) is a San Francisco-based consultant specializing in financial systems for nonprofit organizations and small- to medium-sized businesses.

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"The final test of a font product must be based on the quality of the printed output," said IQE president Michael Gardner. "This is our first goal at IQ Engineering."

This commitment to font quality has earned IQ Engineering accolades from numerous industry critics. Super Cartridge fonts have been awarded two "Best of" awards and a prestigious "Editor's Choice" from PC Magazine.

IQ Engineering's technical innovation continues. They are now marketing a new scalable font cartridge for HP LaserJet III printers. This new cartridge, the Super Cartridge 3/Professional Edition, offers LaserJet III users who are looking for PostScript, a better alternative than a cumbersome emulation cartridge.

The Super Cartridge 3 provides equivalents for the 35 typefaces made popular by PostScript printers--such as Palatino, Avant Garde and Dingbats--plus 15 other type styles. These IQ Engineering typefaces include a version of Garamond Old Style, decorative faces like the medieval English Blackletter and Modern Gothic (similar to Diet Pepsi's logo) and several fixed-width fonts for spreadsheets. And keeping with tradition, IQE's font design is excellent.

If you're looking for PostScript--look first at the Super Cartridge 3...It's a better option for the LaserJet III.

With the Super Cartridge 3 users can access over 40 symbol sets, more than any other scalable font cartridge, for foreign language, math and scientific uses.

Unlike PostScript cartridges for the LaserJet III, Super Cartridge 3 typefaces use HP's own PCL-5, so no conversion from PostScript to PCL language is needed when printing. This means that documents containing IQE's PostScript look-alike typefaces print up to 2.5 times faster than equivalent PostScript faces do on either LaserJet III with an emulator, or on a PostScript printer. This speed factor can be critical for printers on a network or printer sharing device where soft font downloading is unreliable and PostScript lengthens the wait in the print queue.

The Super Cartridge 3 uses the printer's own font-scaling and resolution enhancement feature for fast, 300 dpi printing. It also works well with the LaserJet III's original hardware configuration and can function with all of its resident fonts. Since no language conversion is necessary, the Super Cartridge 3 doesn't require any extra printer RAM or an expensive accelerator board to print.

IQ Engineering supplies HP-standard autofont files that let users install the Super Cartridge 3 automatically in WordPerfect, WordStar, Windows, Microsoft Word and others. Font drivers are provided for Lotus 1-2-3 and Ventura Publisher. Free screen fonts are available for Windows and Ventura.

The Super Cartridge 3, like all IQ Engineering products, comes with a 30-day money back guarantee, a lifetime warranty, and toll-free technical support.

If you're looking for PostScript--look first at the Super Cartridge 3 from IQ Engineering. It's a better option for the LaserJet III. ■

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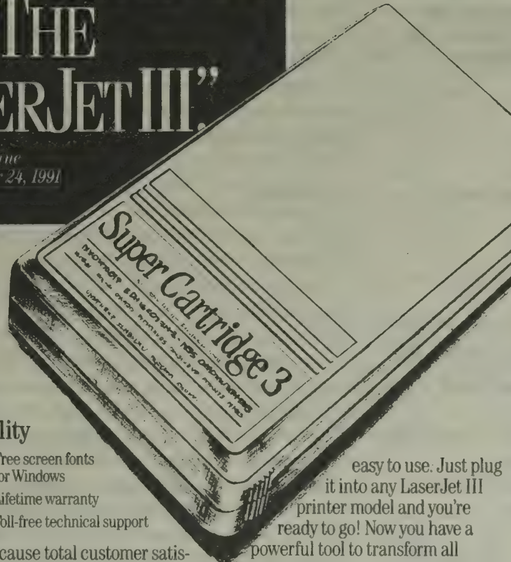
PC Magazine
September 24, 1991



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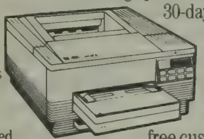

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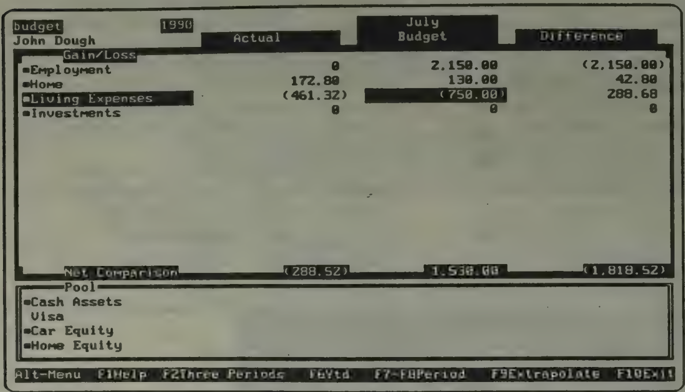

```
budget                1990                      July
John Dough                     Actual          Budget            Difference
   Gain/Loss
■Employment                            0           2.150.00          (2,150.00)
■Home                             172.80             130.00               42.80
■Living Expenses                (461.32)           (750.00)              288.68
■Investments                           0                  0                   0





    Net Comparison              (288.52)           1.538.00          (1,818.52)
   Pool
■Cash Assets
 Visa
■Car Equity
■Home Equity
Alt-Menu  F1Help  F2Three Periods   F6Ytd   F7-F8Period   F9Extrapolate  F10Exit
```

The comparison feature allows you to compare your budget with actuals, and calculates the difference.

TreeBased Financial Software attempts to combine the spreadsheet and checkbook models for computerized accounting. Based on the model of a branched worksheet, TreeBased essentially makes your spreadsheets representative of each transaction.

project. Despite the fact that Jensen describes himself as having little computer and accounting experience, he found TreeBased to be very easy to use. He says he just took it out of the package and began to run it. Now he pushes TreeBased to its limits, keeping track of hundreds of accounts.

Jensen used to use Quicken, which can be exported into TreeBased, but he doesn't now. Nor does he use spreadsheet programs. Instead, TreeBased helps him keep track of inventory, check writing, budgeting, analysis, and forecasting. The only financial transaction Jensen doesn't do exclusively in TreeBased is invoice his customers—for that he uses a database program, which allows him the flexibility he needs in designing the payment terms of his invoices.

TreeBased calculates and tracks transactions not only by dollar amounts, but also by units. You can simply shift into a unit register to view inventory units alongside their corresponding dollar amount.

The current version of TreeBased, 2.0, is the first to offer printer support and font selection. Jensen told me that when he first purchased the program, the TreeBased producers told him he wouldn't need to print. He was dubious at the time, but it's turned out to be true. He said he hasn't even printed a report (which earlier versions of the program allow you to print in ASCII) for months. He prefers to do all his analysis and forecasting right on the screen.

One of Jensen's favorite TreeBased features is auto entry. This allows you to enter a repeated transaction, such as your phone bill, a loan payment, or payroll. You enter it into an "auto voucher," select type (such as average, fixed, or percent), and select whether you want it to fade (for instance, with an estimated amount that you don't want recorded forever in your financial records!) or stay, its frequency and duration. You can edit the record when you receive the actual bill. It also serves as a reminder to when bills are due.

Jensen also likes TreeBased's ability to move forward and backward in time. He finds the program very flexible, allowing the user to design their own accounting setup. Unlike checkbook programs Jensen has used, TreeBased makes it very easy to find items, such as a check written or received several months ago. Using TreeBased with a database program offers him an accounting software solution.

BILLING, TRACKING RECORDS, AND EVALUATING COST EFFECTIVENESS

Dr. Brion Piper is a chiropractor. Like Jensen he also used to use Quicken, and is now an enthusiastic supporter of TreeBased. He first saw it at a trade show, and instantly saw its ability to track the net worth result of each transaction. "That is fantastic!" he said, "I bought it right there on the spot." Piper currently uses TreeBased in conjunction with Dollars and Cents to generate invoices, but expects to switch over entirely to TreeBased once he has the new 2.0 version with printer support. He really likes TreeBased's capacity to record detail and its flexibility.

Piper has two main uses for TreeBased. One is to evaluate the cost effectiveness of chiropractic equipment he invests in. With TreeBased he's able to correlate his equipment's cost with how much revenue it's generating. While he said this doesn't stop him from purchasing equipment that he feels he needs, it does give him a critical gauge for managing his business.

Piper's other main use for TreeBased is one he developed—keeping notes on patients, such as current treatment, plans for treatment, and effectiveness. Detailed notes are hardly a typical function of accounting programs, yet maintaining patient records in TreeBased required absolutely no programming on Piper's part. In TreeBased, any time you record a transaction, you fill out a voucher. You can also create a split voucher, which allows you to break down a bill into its various charges, so much for a particular medicine, so much for treatment on this equipment, and so on. It's possible to write information on your version of the voucher (for instance, cost of goods sold), that doesn't print on the client's invoice. The voucher also has three lines for notes, which is what Piper uses for patient records. Being able to go back in time and access each voucher gives Piper a patient history recorded along with financial transactions—and one that is easily retrievable.

Piper finds the capability of TreeBased to track patient history invaluable. It enables him to see how well a particular treatment is working, and to keep track of new treatment plans. He believes that this capacity offers an important application, such as for legal evidence in a malpractice suit. Should an insurance company have a complaint about the applicability of treatment, or question what they're really paying for, detailed records of the patient's treatment give a chiropractor a tremendous advantage of credibility.

Unlike Jensen, Piper does computer programming, and is currently developing chiropractic software. He thinks that TreeBased can be difficult to use—and that it could be especially difficult say, for a receptionist in a busy office to use while simultaneously answering the phone and dealing with patients.

Both Jensen and Piper also would like to see mouse support for TreeBased. However, they have nothing but compliments for the developers' tech support. In fact, Brion Piper told me that not only does he receive excellent support on the phone, but that tech support will subsequently mail him a printout of the instructions they described to him over the phone. Pretty supportive!

TreeBased's concept of an active worksheet works well, not only for accurate planning, but, especially with the newly released version, as a functional daily accounting program. While not as intuitive as Quicken for instance, it provides a tremendous amount of flexibility and adaptability to a diversity of user needs. ■

RESOURCES:

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200MB IDE	565

VIDEO CARD

Monochrome	$12
CGA-Std Color	17
VGA	62
Super VGA	89
TSENG 4000 VGA	105

All special pricing in this section is good for complete system purchase only as outlined on system worksheet.
Note: Prices are subject to change without notice.

FLOPPY DRIVE

TEAC 360K	$58
TEAC 720K	58
TEAC 1.2MB	58
TEAC 1.44MB	56
SONY 1.44MB	56

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14" Super VGA	305
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System Worksheet

Category		
Motherboard ______	$	______
Memory ______	$	______
Case/Power Supply ______	$	______
Keyboard ______	$	______
Floppy Drives A: ______	$	______
B: ______	$	______
Controller ______	$	______
Hard Drive ______	$	______
Video Card ______	$	______
Monitor ______	$	______
I/O Card 2 Serial, 1 Parallel	$	______
DOS	$	FREE
Assemble, Test, & Burn-In	$	25
Total	$	______

Plus Tax, Shipping & Handling where applicable

HARD DRIVES

3.5 Hard Drive Priced without 5.25 Mounting Kit

20MB, MFM, SEAGATE ST-125-1, 3.5, 28ms	239
20MB, MFM, SEAGATE ST-225 w/Ctlr, 5.25	189/219
30MB, MFM, SEAGATE ST-138-1, 3.5, 28ms	269
30MB, RLL, SEAGATE ST-138R-1, 3.5, 28ms	265
40MB, MFM SEAGATE ST-251-1, 5.25, 28ms	245
100 MB TEAC, SD 3105	295
40MB, IDE, WD 93044, 3.5, Limited Qty.	169
44MB, IDE, SEAGATE ST-157A, 3.5, 19ms	175
60MB, RLL, SEAGATE ST-277R-1, 5.25, 28ms	265
80MB, IDE TEAC SD 380H, 19ms	265
85MB, SCSI, SEAGATE ST-296N, 5.25, 28ms	310
88MB, MFM, SEAGATE (SWIFT) ST-1100, 3.5, 15ms	619
89MB, IDE, SEAGATE ST-1102A, 3.5, 19ms	289
100MB, IDE, CONNER CP-3104, 3.5, 25ms	370
120MB, IDE CP-30104, 19ms	349
124MB, IDE, SEAGATE ST-1144A, 3.5, 19ms	379
200MB, IDE CP-3204, 19ms	565
212 MB, IDE ST-1239A, 19ms	615

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TEAC 360K, 5.25, FD55BR, Beige	58
TEAC 1.2MB, 5.25, FD55GFR, Beige	58
TEAC 720K, 3.5, FDD235F, w/5.25 Kit, Beige	58
TEAC 1.44MB, 3.5, FDD235HF, w/5.25 Kit, Beige	56
SONY 1.44MB, 3.5, MPF17W52D, w/ Kit, Beige ("Best")	56

VIDEO BOARDS

MONOCHROME GRAPHIC Card LPT1 (GOOD)	12
MONOCHROME GRAPHIC Card, LPT1-2 or 3 (Better)	17
DUAL MONO/COLOR GRAPHICS Card	17
CGA, Color Graphics Adapter w/Printer Port	17
VGA REALTEC, 256K Only, 8 Bit, 800 x 600	38
TRIDENT 1024 x 768 w/256K, Exp to 512K	62
VGA Oak Chip Set, 800 x 600, 16 Bit, 256K Only	39
VGA Oak Chip, 512K, 1024 x 768, 16 Bit	53
VGA TRIDENT MTV-8900, 1MB, 1024 x 768, 256 Clr, Non-Inter	89
S/VGA TSENG 4000 CHIP, 1024 x 768, 1MB FAST VGA	105

VIDEO MONITORS

Mono 12" Monochrome, 720 x 350, Amber	82
Mono 14" 720 x 350, Amb/Wht, Flat Screen	89
VGA 14" VIEWSONIC V2, 640 x 480, 29 Dot, Analog, T/S	312
VGA 14", 640 x 480, 39 Dot	245
VGA 14" VIEWSONIC V4, 1024 x 768, 8514/A, 28 Dot	345
VGA 14" 1024 x 768, .28 Dot Pitch	305
VGA VIEWSONIC V5, 14", 1024 x 768, Non-Int	675
VGA 14" VIEWSONIC V6, 1024 x 768, 30-50Khz, .28 NI	435
VGA 14" OPTIQUEST 1000, .28, 1024 X 768, Non-Int, VESA 72Hz	435
VGA 15" OPTIQUEST 2000, .28, 1024 X 768, Non-Int, Flat Scr	565
VGA 17" VIEWSONIC V7, .28, 1280 X 1024, Non-Int	1259
VGA 16" NANAO 9070U, .28, 1024 X 768, Non-Int	1047

CHIPS

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64K, 120ns, 1 x 64K DRAM (4164)	.85
64K, 100ns, 1 x 64K DRAM (4164)	.95
64K, 120ns, 4 x 64K DRAM (4464)	1.50
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256K 70ns, SIM/SIP x 9	15
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1MB 70ns, SIM/SIP x 9	49

MEMORY PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

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150w, Standard Size for PC/XT, (DESKTOP only) (Better)	35
200w, Standard Size for PC/XT, (DESKTOP only)	42
200w, Standard Size for PC/XT, (DESKTOP only) UL Listed	45
230w, Standard AT Case or Full Size Vertical Cases	42
250w, Standard AT DESKTOP only	47
220w, Standard AT Case or Full Size Vertical, UL Listed	52
300w, Standard AT Case or Full Size Vertical, UL Listed	83
230/200w MINI PS for MINI DT or MINI/MID Size Tower/UL	42/47
POWER SUPPLY for LCD Lunch Box Case, 200w	149
POWER SUPPLY for Gas Plasma Case, 180w	189

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XT-12MHz Turbo, ØK, 8 slots, to 1MB, 1/2 size	39
SUPER XT-31MHz, 286 Based, 8-8 bit slots, ØK, to 1MB Supports Shadow RAM for Video & BIOS, Auto Sys Config	59
AT-286-12/16/20 MHz SC/2MB, ØK, 8 slots, Exp to 2MB	67/79/89
AT-286-25 UMC/SOL, 6 slots, AMI, to 4MB	129
AT-286-16 VLSI, ØK, 8 slots, Exp to 4MB, 2/3 Size (MS)	106
AT-286-12/16/20 NEAT, 2 Ser & 1 Par, 8 slots (TM)	188/217/235
AT-286-12/16 ACER CHIP, IDE-F/Ctlr, 2 Ser, 1 Par (TM)	159/199
AT-386-16/20 SX, AMI BIOS, 8 slots	199/225
AT-386SX-16 UMC/Intel, 6 slots, [illegible], Mini-Baby	179
AT-386-25, Non Cache, AMI BIOS, 8 slots, "Great Seller"	299
AT-386-33, 64KC/128KC, AMI BIOS, (SIS/ECS)	425/475
AT-486-25, 64K Cache, 8 slots x 16 bit, ETEQ CHIP, to 32MB	689
AT-486-33, 64K Cache, Exp to 256K, Exp to 32MB (ECS)	769
AT-386-33, 256KC, AMI BIOS (ASUS) ISA	839
AT-EISA 486-33 ASUS, Full Size, 64K Cache Exp to 256K 8 slots (AS)	1549

DOS OPERATING SYSTEMS

MS DOS 3.3 w/GW Basic, OEM Version	47
MS DOS 3.3, Actual Microsoft	68
MS DOS 4.01 w/GM Basic, OEM Version Slim	68
MS DOS 4.01, Actual Microsoft Slim	82
MSDOS 5.0/OEM MS DOS 5.0	77/49
DR DOS 5.0	36

I/O & MULTIFUNCTION

XT SERIAL Card, 2 Ports, 2nd Port Opt. COM 1 & 2	10
XT SERIAL Card, 2 Ports, 2nd Port Opt. COM 1-4	13
XT SERIAL Card, 4 Ports, COM 1-4, 2 Ports Install	61
XT 2nd SERIAL Port Chip & Cable Set	5
I/O PLUS Clk, Cal, Par, Se, Game, 2nd Serial Opt.	35
CLOCK Card, Calendar and clock only: fits into a slot	9
CLOCK Slotless, no-slot clock: fits in a prom socket	29
384K MULTI I/O w/Floppy Controller:Clk, Cal, Par, Ser, Game	55
SUPER MULTI I/O w/Floppy Ctlr - 360K, 720K, 1.2MB and 1.4MB FDD: Cal, Clk, Par, Ser, Game	42
XT/AT PARALLEL PRINTER Port, Sets to LPT 1 only	8
XT/AT PARALLEL PRINTER Port, Sets to LPT1, 2, or 3	9
XT/AT GAME CARD, 2 Ports	8
AT SERIAL Card, 2 Ports, 2nd Port Opt. COM 1-4	15
AT SERIAL Card, 4 Ports Installed. COM 1-8	66
2nd SERIAL Port Chip & Cable Set	7
AT I/O #1, 1 Ser, 1 Para, 1 Game. COM 1-4/LPT 1-2	11
AT I/O #3, 2 Ser, 1 Para, 1 Game. COM 1-4/LPT 1-2	13
AT I/O #4, 2 Ser, 2 Para. COM 1-2/LPT 1-3	22

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1200 External, Special Limited Quantity, GVC/HISLAND	45
2400 OEM with Software	59
2400 Quicktel Int. Modem - 2 yr Factory Warranty, USA	62
2400 OEM ZOOM, Internal with PROCOMM Software	49
2400 OEM ZOOM, External with PROCOMM Software	69
2400 Pocket Modem for Portables, GVC/HISLAND	89
ZOFAX 96/24, Send/Receive Fax at 9600 bps and 2400 bps Data Modem. Comes with Bit-Fax Software. Auto Rec/Print Fax, Flip or Rotate Fax Picture. Time Schedule Transmissions. Background Receiving and more	89

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XT 384K MULTI I/O CARD, ØK, 1 Ser, 1 Par, 1 Game, Cal, Clk	54
XT MEMO 2000X, EMS CARD for XT, Exp to 2MB	83
AT 286 EVEREX RAM 3000, ØK, 3MB Max, Uses 256K DRAM	89
AT 286 EVEREX RAM 8000, LIM 4.0 in Hardw., Direct Mem. Access	199
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XT/AT Like, 2 Exp/2Snt Dr. Bays, LED/Key/Turbo Butt	27
AT STD DESKTOP CASE, 3 Exp 5.25/2 Int Dr. Bays	38
AT MINI-DESKTOP, 230W, 3x5.25, 1x3.5, 1 Int 3.5	75
AT DELUXE DESKTOP CASE, 2+Exp 5.25/2 Int, Top Quality/Dig	49/59
AT VERTICAL/T Full Ht, 220w PS, 6 Exp 5.25 Dr. Bays/Dig	127
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AT MID SIZE VERTICAL, 230w PS, 3x5.25, 2x3.5, 1x3.5 Int, Dig	99
AT MINI SIZE VERTICAL, 200w PS, 2x5.25, 2x3.5	75

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CONTROLLERS

Unless otherwise noted, all controllers supplied with cables

XT, Floppy Disk Controller, FDC 2, 260K/720K	11
XT/AT, FDC+, Controls 360K/720K/1.2MB/1.44MB	19
XT/AT, SUPER FDC+, 4 Drives, All Types	26
XT/AT, COMPATICARD II, Co exist, 2 Drives, All Types	69
XT/AT, COMPATICARD IV, 4 Drives, All Types, Co exist	99
XT, MFM LONGSHINE 6210, 2 Hard Drives	39
XT, MFM,WD XT GEN Clone	34
XT, RLL, DTC 5160	52
XT/AT, SCSI, SEAGATE ST-01/ST-02	43
XT, LONGSHINE 6220, 8 Bit, 2 Floppy/2 Hard Dr.	64
AT, IDE (AT BUS) Hard/Floppy	13
AT, IDE (AT BUS) Hard/Floppy, 2 Serial, 1 Parallel	24
AT, MFM, WA 6M, 16 Bit, 1.1, 2 Hard/2Floppy Dr.	42
AT, MFM, DTC 7280, 16 Bit, 1.1, 2 Hard/2 Floppy Dr.	52
AT, RLL DTC 7287, 16 Bit, 1.1, 2 Hard/2 Floppy Dr.	65
AT, RLL, WD 1006V-SR2 Clone, 1:1, 2 Hard/2 Floppy Dr.	57
PERSTOR PS180 16F, 2H/2 F, Increases Dr. Storage 90%	187
ESDI w/64K Cache MC-1165A, Out-Performs any controller in its price range and more, 2 Fl/2 Hd Dr., 1:1, up to 40% cyl	105
ULTRASTORE ULTRA-12F ESDI Controller, 1:1, Cache on Board, Co exist with other Controllers, Allows Disk Duplexing, Novell NETWARE 386 Compatible, Controls Floppy Drive, 32K Cache	153
AMS 1100 SM4, MFM, Controls 4 Floppy/2 Hard Dr.	50
AMS 1100 SR4, RLL, Controls 4 Floppy/2 Hard Dr.	62

KEYBOARDS

101 KEY KEYBOARD Tactile/Click, 12 Function Keys	33
101 KEY KEYBOARD Non-Click	27
101 KEY KEYBOARD KEYTRONIC (Narrow Ent)	42
101 KEY KEYBOARD KEYTRONIC PLUS (Lg Ent)	42
101 KEYBOARD, Maxi-Switch "a Best Seller"	34
101 NTC Special, 12 Function Keys Left Side	43
FOCUS FK-2001, 101 ENH, w/Solid Dust Cover	44
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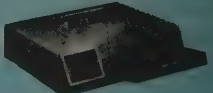

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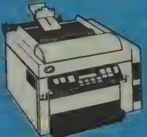

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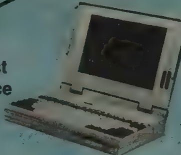

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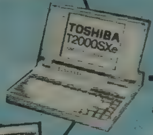

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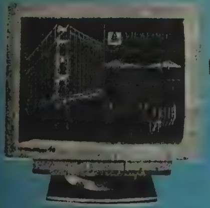

NEC

MultiSync 3FGX $599

MultiSync 4FG $745

PC MAGAZINE EDITOR'S CHOICE April 10, 1990 NEC MultiSync 4D

PRODUCT OF THE YEAR 1990

NEC MultiSync 4D

List Price: $1,799 (cable included)
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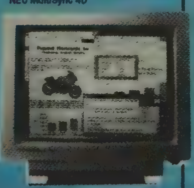

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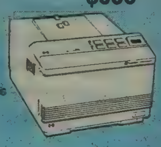

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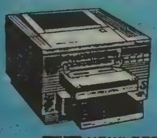

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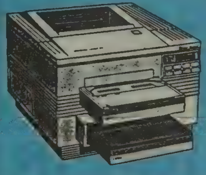

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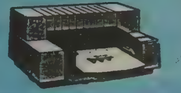

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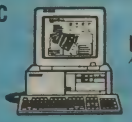

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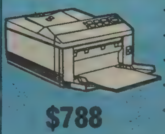

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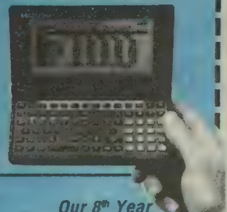

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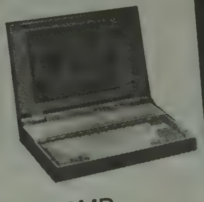

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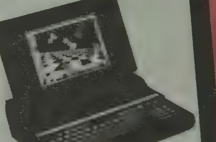

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Maintaining A Competitive Edge With Project Planning

Symantec's On Target Gives Experts And Novices Flexible, Effective, And Easy-To-Use Planning Tools

BY DAVID PLOTKIN

Planning for the future has always been difficult. You might be able to predict the duration of a single task based on experience, but accurately predicting how long a multitude of interrelated tasks will take and what level of resources need to be committed is much more elusive. Yet this ability is critical, especially for tasks where your own or your company's profitability is at stake.

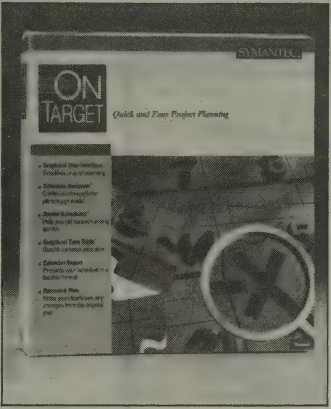
Over the years, techniques have developed for managing projects of all sizes. This body of knowledge, called project management, has evolved its own methods, created an arcane nomenclature, and attracted an avid following of experts. To become a project manager, or expert, in a large company, it is necessary to know such things as Gantt charts, critical paths, slack, and manpower leveling.

PROJECT MANAGEMENT SOFTWARE

Project management is tedious and exceedingly prone to errors. Lots of calculations, for example, are required to translate the number of hours associated with a task into a schedule on a calendar, making allowances for such factors as holidays and vacations, part-time employees, and limited availability of scarce resources. And, of course, in the *real* world, nothing ever goes exactly as planned, so schedules require constant recalculation and adjustment. This means you are not only adjusting a particular task, but all other dependent and secondary tasks.

It didn't take long before computer software to assist project managers started to appear. Heavy hitters like Time Line and Primavera automated much of this drudgery. They can calculate project schedules based on the duration of individual tasks and information on task dependencies and resource availability. These programs track the actual progress of the project, adjusting the schedules for interrelated tasks, automatically, as everything progresses. Products like these, however, have a significant learning curve and require a strong understanding of the underlying principles of how to manage a project. It's no wonder, then, that huge numbers of people didn't go out and purchase Time Line to help them do their jobs. Millions may have mastered the basics of spreadsheets (perhaps the most popular category of software in use), but the price and complexity of the available project management packages are too steep for the casual project manager.

"Casual" project managers abound; these include people who need to manage a small project for the first time, people who need to manage a small portion of a larger project, and small businesspersons trying to create their timetables. These individuals rarely have any formal project management training. Even more frequently, these are people who cannot afford or justify the expense of a major piece of software that will only be used once in a while. So, they do without. If these people are going to get a project management package, it must not only be inexpensive and easy to use, but ideally, it should leverage off other software that these people actually do use on a regular basis.



On Target eliminates most of the demand for a technical background in project management, it allows a person who is not a project management expert to set up and track a project.

PROJECT MANAGEMENT FOR THE REST OF US

On Target is Symantec's newest addition to the project management software arena. This relatively simple, easy-to-use program allows you to set up your schedules primarily using two windows, or views, into your data.

The first view, the Spreadsheet pane, is where you initially enter your data. If you can use a spreadsheet, you will be completely at home here. This view is set up with rows and columns. Each row represents one task, and each column records information about that task, such as task name, duration, etc. The Task Name column can contain summary tasks, with their component detail tasks indented under them. If you make use of this feature, the duration of the summary task will be calculated automatically from the component tasks. The Duration column can represent any time element you want, from fifteen-minute increments through hours, days, weeks,

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David Plotkin is a data analyst for Chevron Corp., Human Resources.

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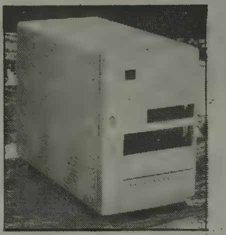

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months, and years. You can set the start and end dates for a task, the person responsible, and an estimate of the cost.

The Task Bar pane is the second view. The start date and duration that were specified in the spreadsheet view are represented here by bars. Across the top in this view is the time—the default is weeks, but you can specify other measures. The task bars begin at the appropriate time and their length indicates their duration. On Target proves its ease-of-use here. If you want to change a task's start time, just drag it to the new position. You can also stretch or contract the length of the bar, changing the task's duration. As you change the duration or the start date, a text block appears that keeps you up to date on the task's information.

On Target's Schedule Assistant pops up any time a change affects the schedule of other tasks. It will inform you of the impact of your actions (such as delaying other tasks, making the current connection invalid, etc.). The Schedule Assistant will ask you what to do to resolve the scheduling issue. For example, if you adjust the duration so that the finish date is no longer valid, On Target will ask you whether you want to adjust the finish date, the duration, or the start date to resolve the conflict.

On Target is Symantec's newest addition to the project management software arena. This relatively simple, easy-to-use program allows you to set up your schedules primarily using two windows, or views, into your data.

Often, one task may not be able to start until another task is finished, while other tasks can overlap. Task linking shows how tasks depend on one another. With this tool, you can click on one task and drag a line to another task. This will join them end-to-end, but you can edit this link to specify exactly how the two tasks work together. You can state the amount of time before/after the start or before/after the end of one task that the second task begins. You can attach a note to each task as well.

Once you have entered your raw data and tuned up starts and durations in the two views, you can start analyzing your information. With persons assigned responsibility for tasks, On Target can tell you when a person is overcommitted—that is, has too much to do (there is even a place where you can tell On Target what is too much). If you want, On Target can delay tasks to alleviate the overwork, or you can assign someone else to the task. In the parlance of project management, this is called manpower leveling. For example, we have a specialist on our project team who is the only person capable of doing certain tasks. He was not available during a two-week period of our project, during which the schedule called for some of these tasks to be done. When we adjusted this individual's calendar to show him unavailable during this time, On Target automatically delayed the schedule of appropriate tasks for two weeks. This changed the project completion date and we had to get approval for a delay in completing the project.

ON TARGET CONSIDERATIONS

On Target has a growing following in the business community, in a variety of environments. The common theme is that it is easy to learn and use, and doesn't require a formal project management background. Daniel Yahdav, a project management software specialist with 1 Soft Decision, assesses the appropriate uses of different software packages. In addition to publishing the quarterly newsletter, *PM Solutions*, Yahdav consults with corporations to help them standardize on project management software.

According to Yahdav, there are a number of considerations that make On Target appropriate for certain clients. While limited in its functionality, this package contains most of the features and functions that users will need. Since it eliminates most of the demand for a technical background in project management, it allows a person who is not a project management expert to set up and track a project.

The basic knowledge you need is only how to enter data, making it similar to working with a spreadsheet. Instead of expecting you to know what to do, the package responds to your input, querying you and getting the rest of the data it needs. It is this intelligence that Yahdav feels sets On Target apart from other packages. Instead of knowing that you need to set up tasks and establish relationships, you simply list your activities. While you do that, the package asks you what date you

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want to do this task, and how you want to link it to other tasks. He also recommends On Target to clients who need a quick start—it comes with sample schedules and a book explaining them, providing a good skeleton for developing your own schedule.

ON TARGET AT WORK

Bill Woloch is a project manager with Sverdrup Corp., a large Engineering/Architecture company, with five thousand employees and twenty-seven offices around the world. It also builds big projects—including the Super Collider, the Chesapeake Bay tunnel, weapons systems, and facilities for the space shuttles. For immense projects such as these, Woloch uses Primavera and Time Line, two of the high-end project management tools.

On Target has a place here too, however. Because it is easy to learn, it is often used for doing the initial scope of a project. People at Sverdrup who are not the more serious users of project management software can pick up On Target and be productive with it quickly. According to Woloch, it has one of the best manuals he has seen, avoiding the usual overabundance of technical jargon. For example, it refers to the Task chart, rather than Gantt chart, and avoids terms such as critical path that are mumbo-jumbo to people without formal training in project management.

Although many people at Sverdrup perform their initial analysis using On Target, they are not limited to using it as their only tool. The results can be moved into another tool for more sophisticated analysis. Using On Target's File Export facility, you can export a Lotus 1-2-3 tab delimited or comma separated value (CSV) file. Any product capable of reading either of these formats will have no problem using the data from On Target.

On Target is also used at Sverdrup to create scenarios—quick schedules before bidding on a job. A series of generic schedules that can be quickly modified for this purpose are kept on hand. These feasibility studies can be done in an hour or two, complete with approximate costs. Woloch also likes the project calendar, which shows how an approximate schedule will lay out in terms of elapsed time.

Finally, there is my experience with On Target. I am a data analyst at Chevron Corporation, working on specifying and installing a large, new mainframe software package. I am the team leader for a team of seven persons, with additional help from other resources as needed. After about two hours working with On Target, I was able to set up a complete schedule for the installation and testing of the new mainframe software using the Task Bar chart. Each task was assigned to a resource, lengths assigned for each task, and project calendars set up. I was able to input different work weeks and include the vacation schedule for each member of the team. The initial schedule had to be revised many times to coordinate resources and to meet a deadline imposed by management. These revisions were straightforward because the Schedule Assistant kept me honest. It was quick work, for example, to adjust the duration of a particular task to indicate that it took more (usually) or less (rare) time than we initially estimated. As mentioned above, we also had to adjust for periods of time when project team members were not available, and this too was easy to do. In the end, the scheduling for this project, valued at about $300,000, went smoothly even though I do not have any formal training in project management software. ■

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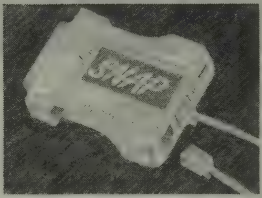

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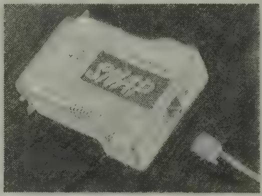

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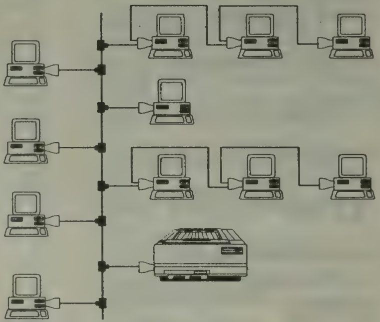

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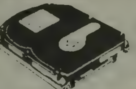

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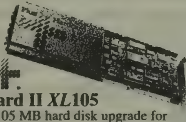

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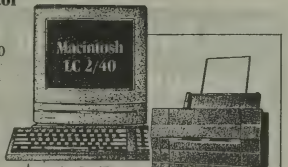

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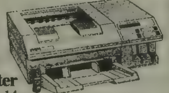

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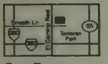

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Securing Your System

Your Password Is Your First Line Of Defense

BY KATE COADY

What's your password?

Unless you understand the most common system-breaking attacks, there's a good chance you picked your password because it was easy to remember. There's nothing wrong with that, per se. The problem is that easy-to-remember is too often synonymous with easy-to-guess.

The opposite condition, hard-to-guess and hard-to-remember, is also common. It may—perhaps surprisingly—be equally un-secure. Saying that a password is hard to remember is usually just another way of saying it's written down somewhere where it will be easy to find. The authorized user may not be the only one who finds it.

There are many aspects of system security, and many different ways of breaching it. Why start with passwords as opposed to, say, file permissions, or loopholes in the operating system? The reason is that providing password security plugs more holes faster, and is more cost-effective, than any other approach.

Tips For Picking Safe Passwords And Keeping Your System Intruder-Free

Exploiting ill-chosen and poorly protected passwords is one of the most common attacks used by crackers (i.e. people who break into computer systems). Almost every multiuser system uses passwords to protect against unauthorized logons, but comparatively few installations use them properly. The problem is universal in nature, not system-specific; and the solutions are simple, inexpensive, and applicable to any computer, regardless of operating system or hardware. Anyone can understand them, and it doesn't take an administrator or a systems programmer to implement them.

The key to understanding password security is to realize that most attacks on it are nontechnical in nature. They are based on understanding the user, not on understanding the machine.

COMMON SYSTEM-CRACKING TECHNIQUES

In order to log onto a computer as somebody you're not, you have to give it a valid username and valid password. Anything you don't know, you're going to guess. This is the primary approach favored by people who break into systems. A related technique involves the would-be intruders broadening their knowledge of the target operation, so their guesses are more likely to be right.

The fundamental countermeasure is make it hard for the cracker to guess the password, and hard to find it by other methods as well.

Secondary countermeasures involve restricting physical access to the target machine, and restricting available knowledge about the operation. The latter technique works a lot better for some kinds of organization than for others.

If the system is online (in this case, this means it's on a network, reachable by phone, or otherwise accessible without getting into the physical facilities of the target organization), or if the invasion is an inside job, perpetrated by an employee or other legitimate user, the assault is much more difficult to defeat. If both of these are true and the system breaker is a programmer, saying you have a problem is like saying the Atlantic Ocean is damp.

Let's examine two situations: that of an outsider who has discovered a target system and is trying to break in "blind," knowing nothing but its phone number, and that of a corrupt employee who already has an account, and wants to gain privilege for dishonest ends, trying to break into high-level accounts using considerable inside knowledge and access to the premises. We won't consider specific techniques demanding significant programming ability.

Note that although there is no dialup access to the system in the insider example, almost all the techniques described can be used against dialup systems by outsiders as well as by insiders. Also, an outside cracker can easily acquire some of the knowledge, such as personal data about employees, that appears in the insider example.

CASE #1: THE OUTSIDE DIALUP

A system that's online is vulnerable to attack as long as it's up, which may be nearly all the time. Adding to the system administrator's troubles is the fact that the talent pool of potential crackers is limited to those within reach of a phone line—i.e., most of the known world.

An outsider attempting to crack your system by dialup access is probably handicapped by limited knowledge of your operation. Given two organizations with equivalent security, if a would-be cracker has comparable knowledge of each, the larger is more vulnerable to dialup cracking.

Why?

One reason is a result of cracker culture. It's much more prestigious for crackers to be able to boast to their friends that they broke into Very Large Automobile Co.'s computer than it is to tell them they broke into Schneider's Garage, so they'll expend more energy on it. Also, those with economic motives are sometimes more likely to target a large system because they're more likely to know what the organization does, and which competitors might be interested in buying stolen information.

The other reason is simple probability. Put yourself in a cracker's place for a minute. You dialed a number, you got a modem carrier, and now you're looking at a screen that says "Welcome to Schneider's Garage. Username:".

You don't know anybody there, so you're going to have to guess usernames...which are often first names, or last names. You start trying common names. What are the odds that Schneider's Garage, which employs a dozen people, employs somebody named Rick? or Al? Well, who knows, but the point is, it's low compared to the probability that VLA Co. employs at least one Rick.

Maybe they don't use first names or last names. Perhaps they use handles like EMP008. You might be able to go onto the net and collect valid usernames from email and articles written by users at VLA Co. (user@vla.com), in which case you won't be guessing. You have more

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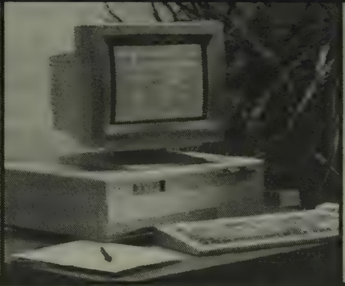

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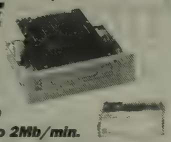

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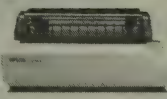

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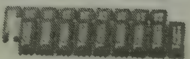

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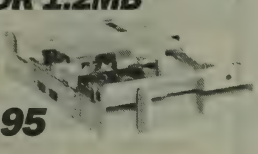

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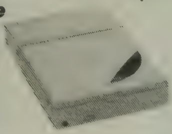

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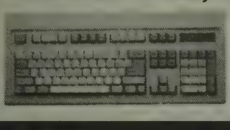

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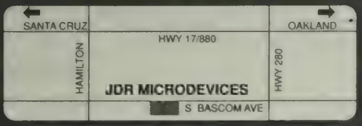

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chance that VLA is on the net to begin with, and more chance of encountering something with a VLA username, than you do of finding anything from Schneider's Garage.

If you do get in, your intrusion is less likely to be noticed at VLA than it is at Schneider's, because one strange login among hundreds is a lot less visible than one strange login among a dozen.

Password guessing works the same way as username guessing. The odds of any given password showing up on VLA's computer are much better than the odds of its appearance at Schneider's.

How do you get computer phone numbers, anyway? You can trade information with other crackers; you can start dialing numbers in the exchange, especially those near the company's published voice number, and see if you get a modem. You can call up the voice line and pretend to be from the phone company, saying you had a report of trouble on the modem line, and can they verify what the number is? You can root around in the phone company dumpster for the datagrade line list. There are some phone number databases that include unlisted numbers.

Crackers like to know what kind of a system they're trying to log onto. For example, if VLA's computer announces that it's running UNIX, that also means a cracker will know the superuser's account is named "root."

What can be done to defeat this?

Most of the following tactics have to be implemented by an administrator, but I think they are also valuable for users to know about, because they illustrate vulnerabilities of data in transmission.

•**Don't use obvious passwords**, like the names of cars, parts, or tools for VLA and Schneider. (Also, see the cautions in the insider example about other dangerous passwords.)

•**Get a modem number that's substantially different from your voice number**, and never give out your modem line number unless the nature of your business demands it. If your voice number is 555-1111, 555-1112 is an obvious place to look for the modem line. Try getting a number farther away from your published voice line, maybe even in the 556 exchange instead of 555.

•**Set your modem to answer on a late ring**, not the first or second. Most crackers doing random-dialing searches for modems will assume that a line that isn't answered in the first few rings is a voice line.

•**Callback modems**, in which the main computer takes an incoming call, hangs up, and calls back the user's previously stored and authorized phone number, can be a help. However, they should always be used in conjunction with other good security practices, not instead of them. At least one brand of callback modem is known to have a back door allowing an unauthorized user to bypass it. Also, many crackers are also phone phreaks (phone system hackers), and the callback mechanism itself can be defeated by rerouting the return call.

The same caution goes for encryption boxes, an expensive option in any event, since you need one on each end: one to encipher, one to decipher. This at least means your passwords aren't going over the line in the clear. I have no specific information indicating that any encryption boxes are known to have back doors, but I know how programmers think because I am one. Don't assume the back doors aren't there.

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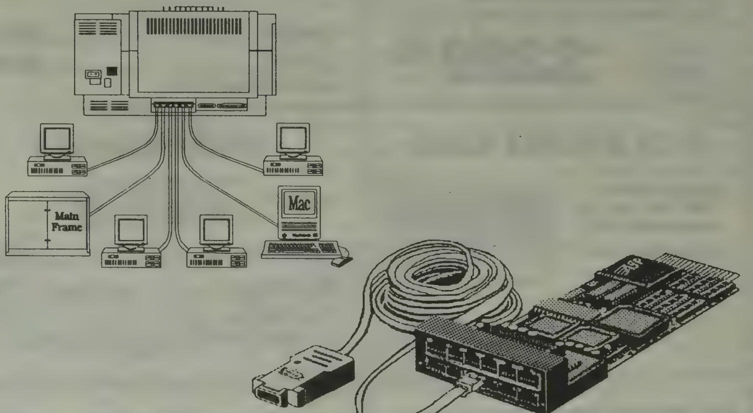

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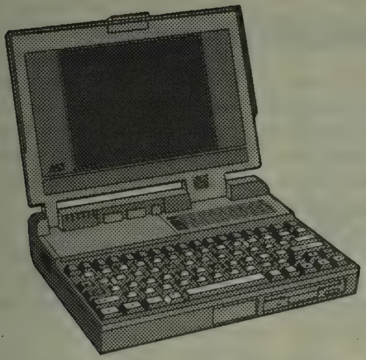

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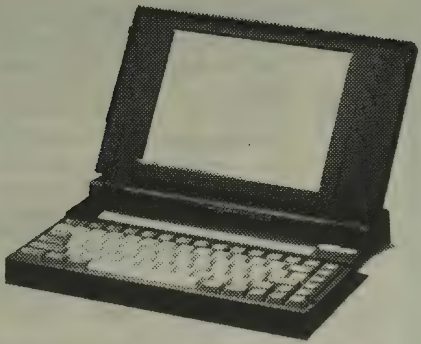

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•**If you can deny root access from a phone line, do it.** Some systems allow you to prevent the system administrator from logging in on certain ports. If you have one of these, prohibit the administrator from logging in on a dialup line.

•**If you can keep your system from announcing that it's Proprietary Operating System 5.07.02, or whatever, before someone logs in, do so.** This keeps the cracker from knowing the names of the administrative logins, and what kinds of attacks are likely to be successful.

•**If your system allows users to list who's logged on before they log on themselves, disable this feature if at all possible.** It provides the cracker with a list of valid usernames.

•**Don't put your company name in the welcome message.** That may help an intruder pick likely passwords, and if you're a well-known company, it may provide more incentive to break in.

•**Don't publish your usernames.** Keeping usernames secret isn't something most systems are designed to facilitate, but if you're not on a net sending electronic mail off-site, you might make usernames a little obscure.

•**Prompt for a password regardless of whether the username is valid.** If you can configure your system so that it asks for a password immediately after a username, whether the username is right or not, do so. That means someone guessing usernames and passwords has to get both of them right simultaneously, which is harder than guessing them one at a time.

CASE #2: THE INSIDE JOB

Let's take another scenario.

The computer isn't online, and somebody wants access to your particular system. They have to get into the building to do that. This is easiest if the system breaker is an employee, although it can be accomplished by breaking and entering, repairing or pretending to repair/inspect something, or plain old chutzpah.

Let's say the culprit is an employee who wants to do something with the records he isn't allowed to do. He has a low-privilege account. What does he do to get enough privilege on the system to accomplish the intended malfeasance? There are several possibilities.

•**Leave a phony login program running on a terminal.** It looks just like the usual login program, and when somebody tries to login, it mails the password to the guilty party, gives the user the same error message as the regular login program does when you type the password wrong, and exits. The next log in prompt the unsuspecting user sees is the real one. The idea is to get passwords of users with more privilege than the culprit has. This requires a little programming capability, but on some systems you wouldn't have to know anything more than basic commands to accomplish it.

As possible countermeasures, the administrator could monitor the system to check for strange programs running on unattended terminals, and configure the system so that it gives a unique response to each user that other users don't know about (sort of like a password in reverse). Users should make a practice of checking their last login date each

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Committed to products of high quality and high performance, **KTX** proudly introduces the new and improved CAD-135 series color monitor. In addition to the new features like up-front controls, it is **absolutely flicker free and has no distortion!**

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- 80386SX/20 Processor
- 30MB/60MB H/D
- 2MB RAM (Up to 10MB)
- Edgelit VGA 32 shade
- 1.44MB Floppy
- 1 S/1 P/VGA/Numeric Keypad

TOSHIBA T2200SX

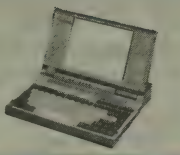
New Arrival

TOSHIBA
T2200SX

- 20MHz, 386™SX processor
- 40MB or 60MB hard drive
- 1.44MB diskette drive
- 2MB RAM expandable to 10MB
- VGA display with 16 gray scales
- 5.5 lbs.

TOSHIBA T2000SXe

In Stock

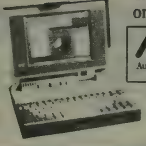


- 80386™SX/20
- 2MB RAM, up to 10MB
- 40/60MB Hard Disk w/19ms
- 1.44MB, 3.5 floppy drive
- VGA Video
- MS-DOS® 4.01

AST Premium® Exec™ 386SX/20

In Stock on Demo

AST. Authorized System Reseller



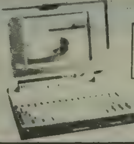
- 386SX/20 MHz
- VGA with 32 gray shades
- 2MB RAM
- 40/60MB Hard Drive

AST, AST Logo and AST Premium registered & Exec trademark AST Research, Inc.

AST Premium® Exec™ 386SX/25

New Arrival

AST. Authorized System Reseller



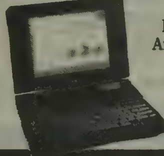
- 4MB RAM expandable to 8MB
- 1.44MB Floppy Drive
- 60/80MB Hard Drive
- VGA output 32 shades of gray
- DOS 5.0
- 1 Serial/1 Parallel port

AST, AST Logo and AST Premium registered & Exec trademark AST Research, Inc.

Not available until January '92

NEC UltraLite™ 386SX-20MHz

New Arrival



- Standard 386SX-20MHz
- 40/60MB Hard Drive
- VGA-16 levels of grey
- Parallel/Serial/VGA/SCSI ports (New)
- Standard with Microsoft Windows 3.0
- 6.4 lbs.

NEC UltraLite™ 286F

In Stock On Demo

- 80C286/12MHz
- 1MB RAM, exp. to 2 or 5MB
- 20MB Hard Disk Drive
- Internal 3.5" floppy drive

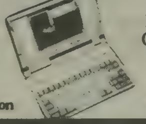
ZENITH data systems Groupe Bull MastersPort 386SX

In Stock

- 386SX/20 MHz
- 2MB RAM
- Backlit LCD VGA
- 60MB Hard Disk
- 6.6 lbs.

ZENITH data systems Groupe Bull MastersPort 386SL

In Stock On Demo

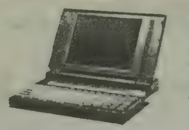


- 386SL-20/5/0MHz
- 2MB/8MB (64K Cache)
- 60MB Hard Disk
- VGA/32
- Standby/Resume
- Rest/Resume
- Panic Save
- Unattended Communication

MICRONICS Mport 333

- Mport 333: Intel 80386DX-33MHz
- VGA 640x480 high-contrast paper white
- 40MB (25msec) or 120MB (19msec) hard disk drive
- Internal 3.5" 1.44MB floppy disk drive
- 32K cache memory
- 4MB RAM standard, exp. to 8MB with 1MBx9 80ns SIMMS
- 1 internal 16-bit half-size slot (7") AT-compatible

MICRONICS MPACT 386SX



16/20MHZ 80386SX

- 16 Level VGA w/External
- 40/60MB IDE Internal Drive
- Internal 3.5" Floppy
- 6.9 lbs., w/Battery

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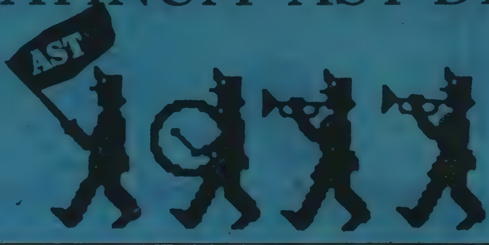
TWO FLAGS



COMP

New Arrival

AST Premium Exec 386SX/25C

Microprocessor and Coprocessor:
- 386SX, 25MHz
- Support for 387SX coprocessor

Disk Drives:
- 3.5", 1.44MB diskette drive
- 2.5" hard disk drive in 60MB or 80MB models

RAM Memory:
- 4MB interleave RAM standard, expandable up to 8MB using 4MB SIMM
- VGA, EGA, CGA, and MDA compatible
- 16 colors at 640x480
- 256 colors at 320x200
- 64 gray shades
- 800x600 Super VGA on external monitor
- LCD and external monitor offer simultaneous operation

Software:
- MS-DOS® 5.0 from AST
- ASTIVGA video manager
- AST Disk Cache
- Windows Suspend Driver
- Protected Mode Suspend Driver

Dimensions:
- System unit: 11.4" W x 2.30" H x 9" D (28.9 cm W x 5.8 cm H x 22.8 cm D)
- Weight: 7.5 pounds (3.4 kg)

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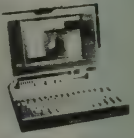
Authorized System Reseller



Not available until January 1992.

AST Bravo Computers

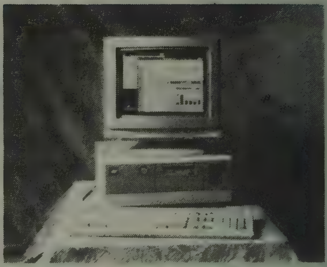
Standard Configuration on all Models

- i486, 25MHz processor (Bravo 486/25)
  386SX, 20MHz processor (Bravo 386SX/20)
  286, 16MHz processor (Bravo 286/16)
- 3.5", 1.44MB Floppy
- Integrated Super VGA graphics
- Five 16-bit industry standard expansion slots
- Four drive bays (2-5.25" external; 2-3.5" internal)
- Two serial, one parallel, one mouse port
- Chassis lock
- Software

Bravo 486/25
- i486, 25MHz Processor
- 2MB RAM (Up to 16MB)

Bravo 386SX/20
- 386SX, 20MHz Processor
- 2MB RAM (Up to 16MB)

Bravo 286/16
- 286, 16MHz Processor
- 1MB RAM (Up to 16MB)

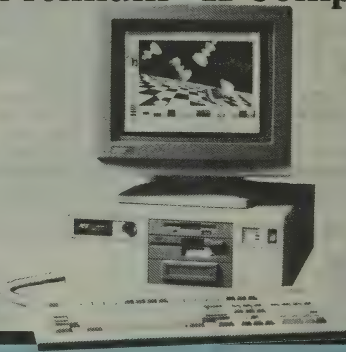


AST Premium® II Computers

PREMIUM II 486/33
Standard Configurations
- Intel i486DX, 33MHz processor
- 4MB RAM (expandable to 16MB on processor board; 80MB system total)

PREMIUM II 486SX/20
Standard Configurations
- Intel i486SX, 20MHz processor
- 4MB RAM (expandable to 16MB on processor board; 80MB system total)

PREMIUM II 386/33
Standard Configurations
- Intel 386DX, 33MHz processor
- 4MB RAM (expandable to 16MB on processor board; 80MB system total)
- 16KB Intel Smart Cache



Standard Configurations on All Models
- Integrated 16-bit Super VGA graphics adapter
- Six total industry standard expansion slots
  - Three Cupid-32/16/8-bit slots (one used by processor board)
  - Two 16/8-bit slots
  - On 8-bit slot
- Five drive bays (One-1/3 height external; Two-1/2 height external; Two-3.5" internal)
- Mouse port
- One parallel port, two serial ports
- Expanded memory manager (LIM EMS 4.0)
- Disk caching software
- RAM disk utility
- Print buffer

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COMPUTERS

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P PRODUCTS

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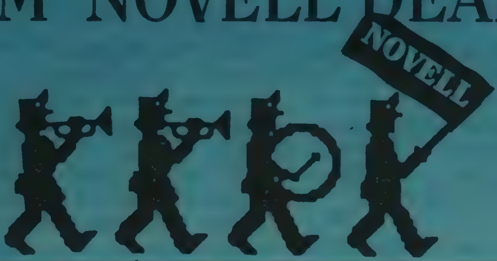

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Network computing for the '90s.

Freedom to choose.

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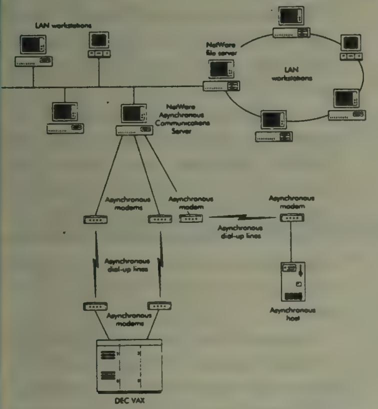
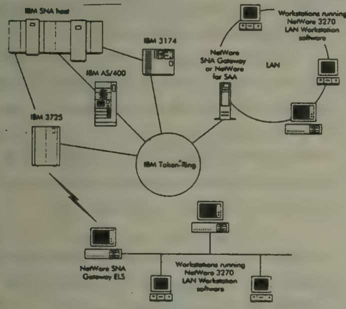
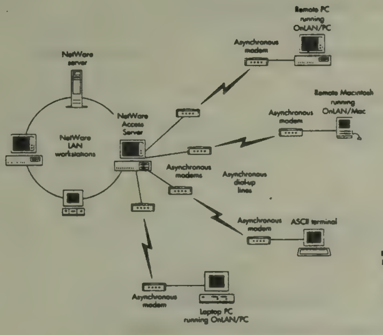
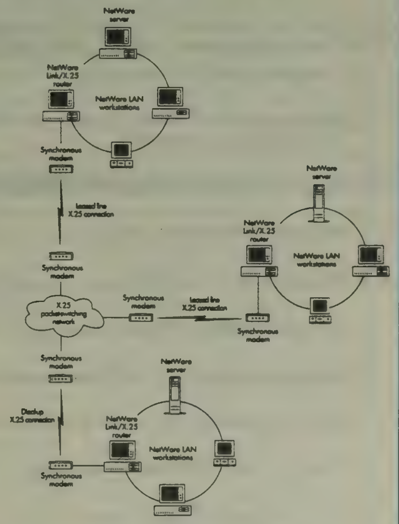
Freedom to choose.

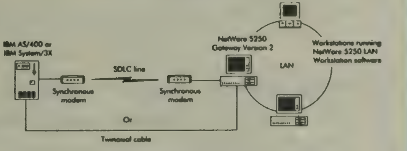
Freedom to choose.


LAN workstations
NetWare file server
LAN workstations
NetWare Asynchronous Communications Server
Asynchronous modems
Asynchronous modem
Asynchronous modem
Asynchronous dial-up lines
Asynchronous dial-up lines
Asynchronous modems
Asynchronous host
DEC VAX


IBM SNA host
IBM 3174
IBM AS/400
IBM 3725
NetWare SNA Gateway or NetWare for SAA
LAN
Workstations running NetWare 3270 LAN Workstation software
IBM Token-Ring
NetWare SNA Gateway ELS
Workstations running NetWare 3270 LAN Workstation software


NetWare server
NetWare LAN workstations
NetWare Access Server
Remote PC running OnLAN/PC
Asynchronous modem
Remote Macintosh running OnLAN/Mac
Asynchronous modem
Asynchronous modems
Asynchronous dial-up lines
Asynchronous modem
ASCII terminal
Asynchronous modem
Laptop PC running OnLAN/PC


NetWare server
NetWare Link/X.25 router
NetWare LAN workstations
Synchronous modem
Leased line X.25 connection
Synchronous modem
X.25 packet-switching network
Synchronous modem
Leased line X.25 connection
Synchronous modem
NetWare server
NetWare Link/X.25 router
NetWare LAN workstations
Synchronous modem
Dialup X.25 connection
NetWare server
NetWare Link/X.25 router
NetWare LAN workstations
Synchronous modem


IBM AS/400 or IBM System/3X
NetWare 5250 Gateway Version 2
Workstations running NetWare 5250 LAN Workstation software
LAN
SDLC line
Synchronous modem
Synchronous modem
Or
Twinaxial cable

NETWARE v3.11

- 32-bit multitasking operating system
- Supports DOS / Windows / Macintosh / OS/2 / Unix
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- Supports volume and files span up to 1024 drives
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- Includes NetWare remote management facility
- Provides developers with tools to write applications
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- Supports workstations running DOS 3.X 4.X 5.0
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time they log in, so that if someone else has used their account, they know it.

The system should show you your last login date, and you should check it. If it shows you as logged in when you weren't, suspect that your account's been compromised and change your password immediately.

•Find a more privileged user logged in on a terminal that's unattended. What the culprit does with this depends on how much time he has, how much he knows, and what he's trying to do—alter the contents of the payroll records, say, or change file permissions so that someone else can access the privileged user's files later.

Users should never walk away from a terminal without logging out or locking it. (Speaking of lock programs, if you're running a windowing environment, a good lock program must prevent the creation of new windows, not just lock all the existing ones, or someone can simply make a new window and get into your account.)

In some environments, expecting users not to leave terminals logged in is probably wishful thinking. In this case, there's no alternative to careful administrative auditing. Even then it's far too easy to miss an unauthorized alteration in some circumstances.

•Watch a more privileged user type her password in.

The countermeasure is to avoid typing your password if anybody can see you. This isn't always easy either.

•Print the password file (if you can read it) and run a password-cracking program. This method is an end-run around the password encryption program—the cracker doesn't actually solve the encryption, but bypasses it. The cracking program takes common passwords, users' names, login names, etc. and encrypts them, then compares the results to the encrypted passwords stored in the password file. When the cracker gets a match, he knows what the plaintext of the password was, and thus can log in.

Administrative countermeasures include making the password file unreadable. The user's countermeasure is to pick an unguessable password that the password-cracking program won't check.

Cryptanalytic attack on the password file, if you can read it, is theoretically possible. To the best of my knowledge, however, it's usually impractical, or at least very hard work, on modern systems. This would involve actually solving and reversing the encryption, not bypassing it as described above.

•Gather a list of valid usernames from printouts, asking the computer who's logged on, etc. Compile common, semi-public information about each user—nicknames, spouse's name, mother's maiden name, pet's name, kids' names, birthdate, anniversary, account number, social security number, phone number, license plate, hobbies and common words from them, job title, common terms from their jobs, etc. Try logging in using these as passwords.

The countermeasure is that readily discoverable information of this sort should never be used for a password. (It shouldn't be used for an automatic teller machine password either. I'm willing to bet that a substantial portion of ATM PINs are birthdates, anniversaries, graduation dates, etc., if they fit into four digits neatly. Far too many of the rest are the last four digits of the user's phone number or social security number.)

Continued on page 240

THE TEN TOP REASONS TO TAKE YOUR NOVELL TRAINING IN DECEMBER.

10. Due to increased liability, you can't drink at office parties anymore anyway (save $100).
9. Its way more exciting (getbackonehundredbucks) than changing over to the '92 organizer calendars.
8. Great way to use up that remaining '91 budget (still retaining $100).
7. Way less frustrating, costly, etc. ($100 off) than holiday shopping.
6. No need for wrapping (save mucho dinero) paper.
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3. Great (big) holiday snacks, hot coffee, etc.
2. The gift (buckcity) that keeps on giving.
1. (Guess what!) $100 Off Any Course.

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- **Baby Tower w/Power Supply**
- **1.2MB or 1.44MB FDD**
- **IDE 2HD/2FD controller**
- **Maxi 101 keys enchanced keyboard**
- **Math Coprocessor socket**
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- **48-hour burn-in (minimum)**
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LOGITECHTrackMan Ser/Bus	$79/89
LOGITECHScanMan256	$259
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MICROSOFTDOS5.0	$60

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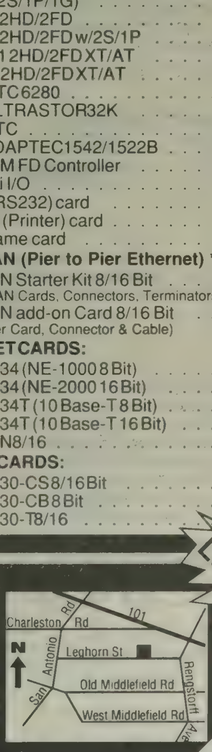

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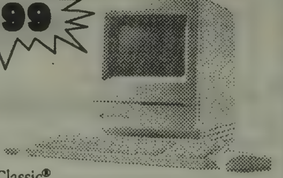

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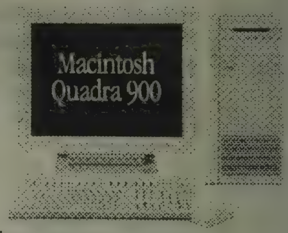

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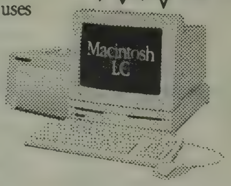

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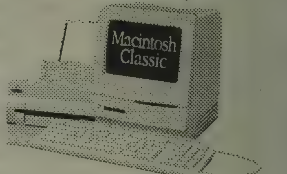

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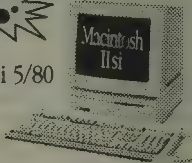

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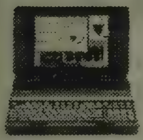

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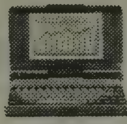

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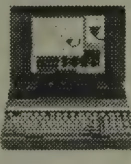

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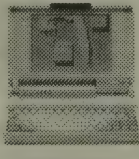

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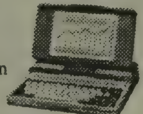

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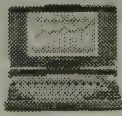

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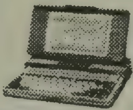

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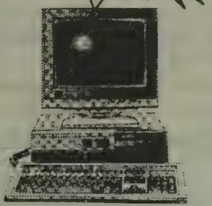

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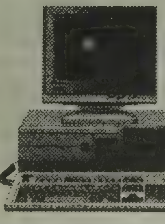

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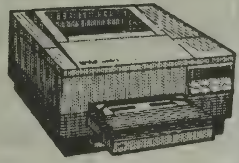

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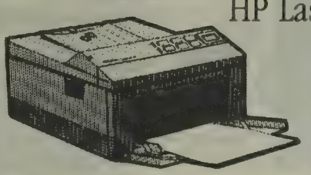
HP LaserJet IIP Plus Printer



The HP LaserJet IIP Plus offers the ideal balance of price and performance. This 4 PPM, 300 DPI laser printer can handle four paper sizes including envelopes and transparencies. Perfect for both DOS and Macintosh®, the IIP Plus can easily be upgraded with the optional PostScript® cartridge and AppleTalk®network interface.

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The LaserJet Fax

Another Part In Hewlett-Packard's Integrated Office Technology

BY ED KAHN

As fast as new technologies appear, they are being integrated into the growing pool of high-tech machines. The fax machine is no exception, becoming more and more wedded to the personal computer. Just a year ago, Xerox brought the future that much closer when it introduced the DocuTech, a 2-ton machine the length of a car. This new $220,000 machine combined the computer, fax, printer, and scanner. It points to the day when paper will immediately be scanned for storage and handled electronically until hard copy is once again needed.

When this expensive machine was announced, I wondered how long it would be until the technology began to filter down to the small office setting. While we are not there yet, the handwriting on the wall has become a lot clearer. Hewlett-Packard has designed a fax machine to work in conjunction with a personal computer and a LaserJet printer.

THIS IS NO ORDINARY FAX MACHINE

The LaserJet Fax, which retails for $1895, offers considerably more than the external fax modems that let you send and receive faxes from the computer. This is a complete standalone fax machine that works with a LaserJet printer. One of the obvious results from this combination is a plain paper fax machine. Standalone plain paper fax machines that have a laser engine cost upwards of $2500. While the combination of a LaserJet III printer and this fax unit is not significantly more expensive than the standalone laser print plain paper fax, you get a lot more. First of all, you get one of the best laser printers on the market. If you already have the printer, it is definitely worthwhile to examine this new fax unit.

The HP LaserJet Fax combines a fax machine and the LaserJet printer with your computer to offer a bit of tomorrow's high-tech future today

As a standalone fax machine, Hewlett-Packard has designed some unique features into the machine. Unlike most fax machines, you insert the document to be faxed *after* you enter the phone number and press the start button. The advantage is that you do not have to make a note of the fax number to where you want the document sent. This is certainly no major breakthrough, but it is a convenience.

In some ways, I was disappointed with the fax machine as a standalone unit. It is actually an entry-level machine. It will only accommodate five pages in the feeder. Many of the better standalone machines handle ten pages. My main objection, however, was about the quality of the paper transport mechanism. This transport will not take thin paper, which means you must make a copy of a thermal fax before you can resend it as a new fax. Also, there is no automatic redial or even a redial button. The reason for this absence, I suppose, is that the machine holds forty speed dial numbers, and if you are faxing to one of these people, it is simple to repress the speed dial number again. Another feature not found in the Jet Fax, but found in other, more expensive fax machines, is a log of who placed each outgoing fax. Likewise, the HP Jet Fax does not allow you to send the same fax to multiple recipients or to delay the time of transmission.

The rationale behind these omissions seems to be that this fax is designed to shine when used in conjunction with a personal computer. The software that comes with the unit gives you a great deal of control in sending computer-generated faxes. A distribution list, for instance, can easily be created by selecting phone numbers from the various phone books you can create using the software. Then the same faxes can be easily sent to everyone on the list. A lot of my objections are addressed in a new version of the software due out before the end of the year. It is easy to incorporate features such as delayed calling and redial into the software design, and Hewlett-Packard seems intent on continuing to improve this product through software upgrades. The new software will also support Windows.

USING THE LASERJET FAX

When you fax to another HP LaserJet Fax, you will discover remarkable quality. Rather than look like the typical fax, the copy will look as if it was printed directly onto a LaserJet printer from a computer. When you create documents on the computer for faxing, you can incorporate text, graphics, excerpts from spreadsheets or databases, and virtually anything else you want. The files must be translated into either ASCII, TIFF, PCL, or PCX. If a document is created in WordPerfect, it's even easier to send as a fax; there's a macro that works with WordPerfect 5.1 that automatically converts the file to PCL for accurate transmission. This lets you send underlines, bolds, and other character enhancements that are stripped away when you convert a file to ASCII.

One of the accessories that Hewlett-Packard offers is a Fax Fonts package ($150) containing software that allows you to send LaserJet supported typefaces. This new software also supports scalable fonts. The fax machine does not support an unlimited number of fonts, therefore it is necessary to have the additional software if you want to send customized text. This allows you, for example, to prepare elaborate text pages, using different size fonts, and fax it directly from the computer. Without the font package, you would have to print the document and then have it scanned by the fax machine.

The fax machine includes some memory—enough to store about thirteen pages of text. An additional memory board is available ($230) that will increase this to sixty pages. Currently, even though you can store up to sixty pages of text, when the printer is turned off only one transmission, five pages, can be stored. When the new software is ready, you will be able to store an unlimited number of transmissions

Continued on page 90

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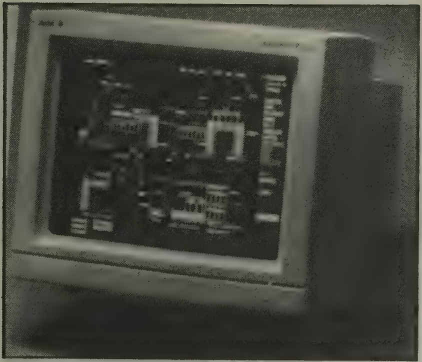

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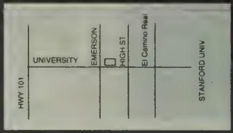

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4 MB RAM (Add $164 for 8 MB RAM)
1.2 MB 5.25" Floppy Drive
1.44 MB 3.5" Floppy Drive
Dual Hard/Floppy IDE Controller
120 MB Conner or Maxtor Hard Drive
(Add $200 for 200 MB)
1 Parallel, 2 Serial, Game Ports
High Quality 101 Enhanced Keyboard
1024x768 .28 DOT Pitch 14" Color Monitor (Add $65 for non-interlaced)
1 MB Trident SVGA Card
(Add $35 for Tseng Lab)
(Add $75-99 for Orchid ProDesigner 2S)
Choice of Mini-Tower, Medium-Tower, Full-Tower, or Desktop
(All with 285 Watt power supply)

PRICE: $1499 For 386/33

PRICE: $1534 For 386/40

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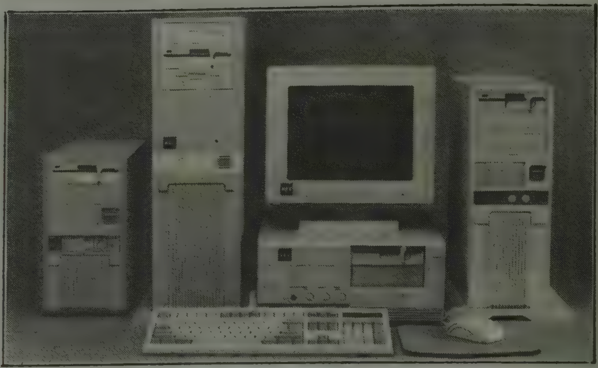

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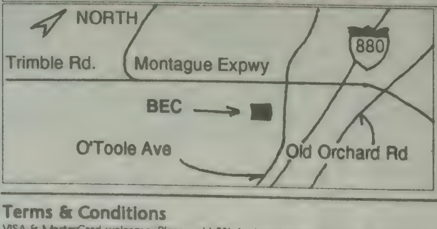
THIS MONTH'S WINNERS

(With basic configurations only)

486 -33 ISA 64K Cache	$958
486-25 ISA 64K Cache	$868
386-40 64K Cache	$648
386-33 64K Cache	$568
386-25 64K Cache	$508
386-25	$488
386SX-25	$428
386SX-16	$398
286-16	$288
286-12	$268

Basic System Configuration includes:
Motherboard & CPU • 1.2MB or 1.44MB Floppy Drive •1MB memory • 1:1 2HD/FD IDE controller
Math coprocessor socket • 2S/1P/1G Ports
Case & Power Supply • Internal clock/calendar
101Enhanced Keyboard
All systems come with DOS 4.01 - FREE



GOLD MEDAL SPECIALS

486-33 ISA 256K Cache
- Basic system configuration
- IDE 120MB 19ms hard drive
- 14" SVGA monitor

1074x768 w/1MB SVGA card
$1688

486-25 ISA Cache System
- Basic system configuration
- IDE 12MB 19ms hard drive
- 14" SVGA monitor

1074x768 w/1MB SVGA card
$1538

386-25 Cache System
- Basic system configuration
- IDE 40MB hard drive
- 14" SVGA monitor

1074x768 w/1MB SVGA card
$968

386SX-25 System
- Basic system configuration
- IDE 40MB hard drive
- VGA monitor w/512K16bit VGA card

Special **$848**

286-16 System
- Basic system configuration
- IDE 40MB hard drive
- VGA monitor w/512K 16bit VGA card

$706

486-33 ISA 64K Cache
- Basic system configuration
- IDE 120MB 19ms hard drive
- 14" SVGA monitor

1074x768 w/1MB SVGA card
$1618

386-33 Cache System
- Basic system configuration
- IDE 12MB 19ms hard drive
- 14" SVGA monitor

1074x768 w/1MB SVGA card
Special **$1158**

386-25 System
- Basic system configuration
- IDE 40MB hard drive
- 14" SVGA monitor

1074x768 w/1MB SVGA card
$938

386SX-16 System
- Basic system configuration
- IDE 40MB hard drive
- VGA monitor w/512K16bit VGA card

$798

286-12 System
- Basic system configuration
- IDE 40MB hard drive
- VGA monitor w/512K16bit VGA card

$686

BEC Motherboards
for system upgrades only

286-12MHz	$70
286-16MHz	$80
386SX-20MHz	$200
386-25MHz	$140
386-33MHz 64K cache	$185
486-33MHz 64K cache	$260
486-33MHz 256K cache	$330

Monitors, Cards & Modems

14" SVGA 1024X768 .28mm monitor w/16bit 1MB SVGA card	$350
14" VGA color monitor w/16bit 512K VGA card	$285
12"/14" mono monitor w/MGP card	$85/105
Paradise VGA 1024x768 256K	$55
Trident VGA 1024x768 1MB	$85
Internal Modem 2400 baud	$45
IDE controller card 2HD/2FD	$13
ATI/O (2S/1P/1G) card	$12
IDE controller W/I/O 2G/1P/1G	$23

Hard Drives

CONNER	
CP3044 42MB IDE 25ms	$215
CP3104 104MB IDE 25ms	$325
CP30104 120MB IDE 19ms	$345
CP3204F 205MB IDE 16ms	$570
SEAGATE	
ST157A 40MB IDE 28ms	$175
ST277R 65MB RLL 28ms	$275

Please call for items not listed.

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BASE SYSTEMS:

Include - CASE, POWER SUPPLY
101 KEY KEYBOARD,
1MB RAM, 2SPG
IDE HARD/FLOPPY Con.
1.44 FLOPPY DRIVE

FREE MOUSE

(SEE BELOW FOR ADDITIONS)

BASE SYS PRICES:

286-12/16/20	$284/305/323
386SX16/25	$399/440
386DX-25	$506
386DX-25/33C	$570/610
386DX-40C	$639
486DX-25/33C	$885/945
486DX-33C.US...CC	$1110

MYLEX SERVERS:

32 Bit EISA; 8MB; 213MB Caching SCSI; 33MBy/sec I/O; 25 MBy/sec Disk transfer; 486EISA

32 Bit ISA; 4MB; 213MB Caching SCSI; 32 Bit I/O; 13MBy/sec data transfer; 386 ISA

$3,999/2,695

Starter ATs & XTs:

Case, KB, RAM, IDE, 1.44T,

386SX-25.1MB	$385
286-12..512K	$230
XT, 640K, 360KFD	$210

BLACK.........BLACK

CASE, KB, SVGA MON, MOUSE

486 UNIX System.

486-33, 16MB, 338MB HDD IDE, SVGA, KB, 2 FLP, EVEREX/SCO OS, MOUSE

READY TO GO.................... **$4395**

MOTHER BOARDS:

XT-10		$45
286-12	C&T	$64
286-16	VLSI	$85
286-20	PC	$103
386SX-16/25		$159/194
386SX-16 Mylex		$170
386DX-25		$274
386DX-25/33C		$335/365
386DX-33C...US		$408
386DX-40C		$399
486DX-25C		$595
486DX-33C		$671
486DX-33C...US..CC		$856

(tested on UNIX; IDE, I/O)
all boards include CPUs

CONTROLLERS:

IDE 2FD/2HD	$17
IDE 4FD/2HD.....US	$37
IDE W/ 2SPG	$27
MFM 2FD/2HD	$39/59
RLL 4FD/2HD..US	$75

SCSI

DTC/FD	$125/49
ADAP 1522B/kit	$130/157
ADAP 1542B/kit	$235/277
Mylex EISA	$660

ESDI

DTC...16	$125
MAPLE..64K	$107
ULTRA 32K	$177
XT FDC/HDC	$13/45
XT MFC 2FD/4FD	$24/28

ADAPTORS:

Mono Graphic Card	$13
CGA mono and printer ports	$23
VGA OAK 256/512	$37/51
VGA Trident 1MB	$79
VGA TSENG 1MB	$99
VGA Orchid IIs 1MB	$175
VGA Orchid II 1MB	$197
VGA V7 1024i	$167
VGA V7 VRAM	$355
9GXi 22/23/24	$849/1125/1345
SGX 1280/1600	2750/2950
Modem 2400..AMS US	$49
Modem 2400 EXT	$87
Modem 9600.V.42bis	$419
Fax/Modem..9600 AMS	$89
US Robotics HST ext	$868
2Serial/Parallel/Game	$15

K.BOARDS/ENTRY:

Sejin 101	$29
Maxi Switch/Click	$41/37
Keytronic/OMNI	$48
Black	$43

SCANNERS ....Mouse

Aero BW/Grey	$109/209
Artec Grey 32	$120
Color..hand/Full	$345/1245
Black Mouse	$27
Mouse/T Ball	$18/25
Logitech S/P	$65/75
Microsoft Mouse	$85

DRIVES:

Teac 1.2/1.44	$56/54
Floppies 1.2/1.44	$.55/.86

IDE

ST/CON/QUAN 42	$163
ST 89/210	$265/565
ST 338/426	$1077/1397
CON/Mxt/Quan 84	$262
CON/Mxt/Quan 120	$339
CON/Mxt 204	$519
MXT 213/340	$587/923

MFM/RLL

KALOK 20 MFM		$127
ST 40	MFM	$217
ST 60	RLL	$267

ESDI

ST 172/338	$737/1167
MXT 203	$757
MXT 338/670	$1067/1322

SCSI

CON 40		$209
CN/MXT120/204		$345/593
ST 89		$287
ST 172/338		$607/1057
ST 680/1G		$1299/1875
MXT 81/157		$297/827
MXT 213/340		$587/925
MXT 670/1G		$1322/1975
Fj 380/680		$1119/1260
Fj 1G	5Tr	$1865

TAPE

COL..120/250	$240/289
2120 Crtrdge	$21

REMOVABLE HDD

Syquest 44/88M	$347/475
44/88MB Crtdge	$73/122
SCSI FD CONT	$49

NOTE BOOKS: SX20, 2MB, 40MB, all acc.......$1850
HDDs: CON40/60/85...$365/450/555; EXT FDD: $275

MONITORS:

Mono 9"/12"		$93/77
Mono 14" wht		$103
Mono 9"/14" VGA		$117
VGA....51/.39		$199/221
VGA....28..640x480		$269
SVGA...39/.28.1024		$252/287
SVGA CTX/V4E		$307/317
SVGA 1024 V6 NI		$395
VGA M/Syn	V3	$467
Sony 1304		$583
Viewsonic 5		$557
Samsung 17"		$857
Nanao..9080i		$1085
IDEK..5117/5217		$989/1045
Taxan 17"	MV875	$1245
HIT 2085	1280NI	$1745
HIT 2087	1600NI	$2125
Viewsonic 8		$1795
Toshiba 21"		$2177
Sony GDM 1936		$2599

PRINTERS:

Citizen 200GX	$163
Citizen GSX130	$255
..color option	$42

LASER

OKI Laser 800 8ppm	$925
Toner	$45
OKI 830 Post Script	$1299

MEM EXT. CARDs

HP 2M/4M	$127/207
Pr Cable....6'/15'	$5/7

NETWORK PROD:

NE 2000	$177
NE 2000 Comp	$120
WD 8/16 Elite +	$145/175
3COM Etherlink II	$187
10 Base T 8/16	$138/148
Hubs, UPSs, etc..	

NETWARE

V2.2 5/10/50	$499/1095/1945
V3.11 ..20/100	$1945/3895
V3.11 250 user	$6895
Light w/ DOS 6.0	$84

CD ROMS:

Sony 531 Kit	$387
Encyclopedia	$77
US Atlas	$43
Game Pak	$47
(all together	$547...)

CASES, Etc:

XT Case w/ PS	$57
Baby Case w/ PS	$67
Full AT w/ PS	$83
Mini/Med Tower	$67/89
Full Tower w/ PS	$109

Black Cases w/ PS

Black Baby/Mini	$91
Black Med. Tower	$135
Black Full Tower	$152

Power Supplies

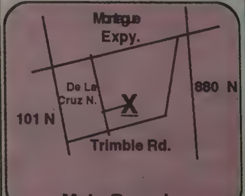
150 XT/PC POWER	$36/85
220 AT	$48
Mini/Full Tower	$41/59
Full Tower..300W	$80

MYLEX:

386SX-16	$170
386-25/33.C	$510/610
486-33C..ISA	$1150
486-33C..EISA	$1572
SCSI EISA	$660
Ethernet EISA	$327
GXE..VGA EISA 020B	$1199

SOFTWARE

MS Windows w/mse	$69
DOS3.3/4 w/sys	$36/42
DOS5/6..w/sys	$55/69
Acc Pac Full Service	
Word Perfect 5.1	$265
Lotus 1-2-3 V2.3	$345
Aldus Page Maker 4.0	$499
Corel Draw 2.0	$412
Sound Blaster	$119



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November 6, 1991

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MONTHLY SPECIALS

Comet Micro ISA 486
33MHz with 256K Cache

Full Size Tower 250W Power Supply w/ Digital Display
486DX 33MHz 256K Cache (US Made, FCC Class B)
4MB 70ns RAM, Expandable to 64MB
IDE 2 Hard/2 Floppy Drives Controller
Teac 1.2M and 1.44M Floppy Drives
Conner CP3204F 210MB Hard Disk 64K Cache
2 Serial/1 Parallel/1 Game Ports
Orchid Prodesigner IIs with 1MB & Sierra DAC
Sony 1304 Super VGA Monitor .25mm
Keytronic or Maxiswitch Enhanced Keyboard
$2,580.00

Comet Micro ISA 386
33MHz with 64K Cache

Desktop Case with 200W Power Supply
386 33MHz 64K Cache, C & T Chip Set
4MB 70ns RAM, Expandable to 32MB on Board
IDE 2 Hard/2 Floppy Drives Controller
Teac 1.2M or 1.44M Floppy Drive
Conner CP30104 120MB IDE 19ms Hard Disk
2 Serial/1 Parallel/1 Game Ports
Orchid Prodesigner IIs with 1MB & Sierra DAC
Sony 1304 Super VGA Monitor .25mm
Keytronic or Maxiswitch Enhanced Keyboard
$1,835.00

Comet Micro 386SX 25MHz

Desktop Case with 200W Power Supply
386SX 25MHz 2MB 70ns, Up to 16MB on Board
IDE 2 Hard/2 Floppy Drives Controller
Teac 1.2M or 1.44M Floppy Drives
Conner CP30084 84MB IDE 19ms Hard Disk
2 Serial/1 Parallel/1 Game Ports
Trident SVGA Adapter with 1MB
ViewSonic 4E .28mm 1024 X 768 SVGA Monitor
Keytronic or Maxiswitch Enhanced Keyboard
$1,095.00

Please come and see the demo today.

System Boards:

All system board come with CPU and 0 RAM	Unit Price
EISA 486 33MHz 256K Ram Cache	1,575.00
ISA US Made 486 33MHz 256K Ram Cache	895.00
ISA 486 33MHz 256K Ram Cache	855.00
ISA 486 33MHz 128K Ram Cache	825.00
Micronic 386 33MHz 64K Cache	590.00
Mylex 386 33MHz 64K Cache	510.00
ISA 386 40MHz 64K Ram Cache	465.00
ISA 386 33MHz 128K Ram Cache	450.00
ISA 368 33MHz 64K Ram Cache	415.00
386SX 25MHz, Up to 16MB on Board	215.00

Hard Drives:

Conner CP3204 210MB IDE 16ms	$540.00
Conner CP30104 120MB IDE 19ms	350.00
Conner CP3104 100MB IDE 19ms	325.00
Conner CP30084 84MB IDE 19ms	295.00
Conner CP3000 40MB IDE 25ms	180.00
Kalok KL320 20MB MFM 40ms	130.00
Kalok KL330 30MB RLL 40ms	140.00
Maxtor 1.02GB Panther Drives SCSI 13ms	1,950.00
Maxtor XT8760E/S 675MB ESDI or SCSI 16ms	1,375.00
Maxtor LXT340A/S 340MB IDE or SCSI 13ms	945.00
Maxtor LXT213A/S 210MB IDE or SCSI 15ms	575/595
Maxtor LXT7120A 130MB IDE 15ms	365.00
Maxtor LXT7080A 85MB IDE 17ms	290.00
Quantum PRO40AT IDE 19ms	190.00
Quantum LPS120AT 122MB IDE 15ms	365.00
Quantum PRO210AT 210MB IDE 15ms	575.00
Quantum LPS240AT 244MB IDE 15ms	595.00
Seagate ST1480A/N 426MB IDE or SCSI 14ms	1,295.00
Seagate ST1144A 130MB IDE 19ms	365.00
Seagate ST1102A 89MB IDE 19ms	289.00

Monitors:

Hitachi CM2085+ 20" .31 1280 X 1024 SVGA	$1,700.00
Hitachi CM2187M 21" .31 1600 X 1280 SVGA	2,560.00
Idek MF5221 21" .31mm 1280 X 1024 SVGA	2,060.00
Idek MF5217 17" .28mm Super VGA 70Hz	1,040.00
NEC 5D 20" .31mm 1280 X 1024 SVGA	1,930.00
NEC 3/4FG 15" Flat Screen SVGA Monitor	675/775
NEC 4DS/3DS Super VGA Monitor	1090/540
NEC 2A 14" 800X600 VGA Monitor	419.00
Nanao N9500 20" .31mm 1280 X 1024 SVGA	1,850.00
Nanao N9080i 16" .28mm 1280 X 1024 SVGA	1,070.00
Seiko CM2050 20" .31mm 1024 X 768 SVGA	1,750.00
Sony 1304 .25mm 1024 X 768 SVGA	565.00
Taxan UV1000 20" .31mm 1280 X 1024 SVGA	1,850.00
Toshiba P21CM00 21" .31mm 1280 X 1024	2,150.00
Relisys 14" SVGA Monitor 1024 X 768 .28mm	300.00
ViewSonic 8 20" Super VGA Monitor	1,750.00
ViewSonic 7 17" 1280 X 1024 SVGA Monitor	1,225.00
ViewSonic 6 .28mm SVGA 1024 X 768	380.00
ViewSonic 5 .25mm 14" SVGA Monitor	510.00
VeiwSonic 4E SVGA Monitor 1024 X 768	320.00
ViewSonic 1 14" VGA Monitor 640 X 480	249.00
14" Amber Monochrome Monitor	105.00
14" Paper White Monochrome Monitor	125.00

Floppy Drives:

Teac 5.25" 1.2MB Floppy Drive	$58.00
Teac 3.5" 1.44MB Micro Floppy Drive	58.00

Video Adapters:

	Unit Price
ATI Wonder XL 1MB & 400 dpi Mouse	$215.00
ATI Graphic Vantage 1MB & 400 dpi Mouse	360.00
ATI Graphic Ultra 1MB VRAM & 400 dpi Mouse	585.00
Diamond SpeedStar Plus with 1MB	189.00
Orchid Fahrenheit 1280 w/1MB VRAM	305.00
Orchid Prodesigner IIs w/1MB & Sierra DAC	185.00
Video 7 Spea 1280 2MB/1MB VRAM/DRAM	1,945.00
Video 7 VRAM II with 1MB VRAM	365.00
#9GX Level 2 to 5	CALL
Metheus Graphic Adapters	CALL
Paradise OEM SVGA with 256K/512KB	75/95
Trident 8900 Chip Set 1MB SVGA Adapter	89.00
Mono Graphic Adapter	18.00
Oak 16Bit VGA Adapter 800 X 600	47.00

Add-On Cards:

2S/1P/1G Ports I/O Card for 286/386/486	$18.00
IDE 2 Hard/2 Floppy Drives Adapter	18.00
IDE with 2 Serial, 1 Parallel, 1 Game Ports	32.00
DTC 7287 RLL 1:1 Hard/Floppy Controller	74.00
DTC 6280-24 24MHz ESDI Cache Controller	140.00
Ultrastor ESDI Controller w/32K Buffer	164.00
Adaptec 1542B SCSI Controller Kit	279.00
DTC 3280 16 Bit SCSI Controller	147.00
SCSI or ESDI Controller for EISA Bus	CALL

Input Devices:

Keytronic 101 Keys Plus Keyboard	$44.00
Northgate 101 Keys Enhanced Keyboard	69.00
MaxiSwitch 101 Key Keyboard	44.00
MS/PC Compatible Mouse	24.00
Microsoft 400 dpi Serial/Bus Mouse	88.00
Logitech 400 dpi Serial/Bus Mouse Man	64/69

Printers:

Panasonic KXP4450i 11ppm Laser Printer	$1,150.00
Panasonic KXP4420 8ppm Laser Printer	799.00
HP LaserJet III 8 ppm	1,495.00
HP LaserJet IIIP 4 ppm	1,030.00
Pacific Page XL with 2MB & Accelerator	CALL
Ram Upgrade Board w/1MB for KXP4450i/4420	105.00
Ram Upgrade Board w/1MB for HPLJ II/III/P	95.00
Panasonic KXP1124i Dot Matrix 24 pin 300 cps	289.00

Miscellaneous:

6' Parallel Printer Cable	$5.00
Keyboard Extension Cable	5.70
Monitor Extension Cable EGA/VGA	8.25/13.50
Sound Blaster Board	135.00
Colorado Jumbo 120MB Tape Backup	265.00
Colorado Jumbo 250MB Tape Backup	299.00
Full Size Tower with 250W Power Supply	155.00
Middle Size Tower with 230W Power Supply	115.00
Mini Tower with 200W Power Supply	90.00
Mini Case with 200W Power Supply	87.00
Mini Case with 230W Power Supply	89.00

Power Supplies:

150W XT Size Power Supply	$49.00
200W XT Size Power Supply	59.00
200W Square Size Power Supply	59.00
230W AT Size Power Supply	59.00
230W AT Size Power Supply for Tower Case	69.00
300W AT Size Power Supply for Tower Case	99.00

Comet Micro System

1301 Grandview Drive
South San Francisco, CA 94080
Phone: (415) 615-9123 FAX: (415) 615-0287
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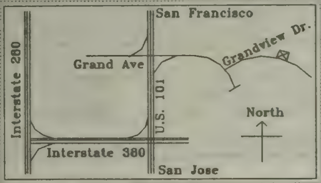

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Three years warranty on labor
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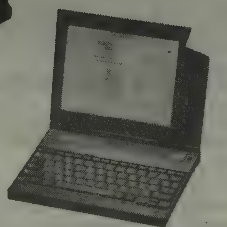

$ 979.00

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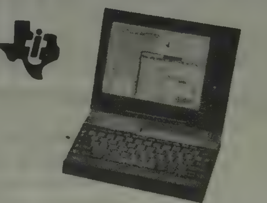
- 4.4 Pound 286 Notebook
- VGA Display 640 X 480
- Sleek design ---- only 1.4" thin
- MS-DOS, LapLink, and Battery Watch included

TM3000 Notebook



TM3000 w/20MB	$1999
TM3000 w/30MB	$2199
TM3000 w/40MB	$2299
TM3000 w/60MB	$2559
TM3000 WinSX 60MB	$2999
TM3000 WinSX 80MB	$3299

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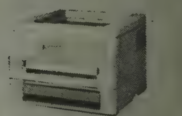

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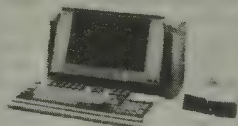

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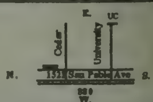

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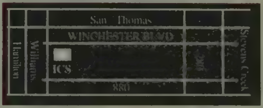

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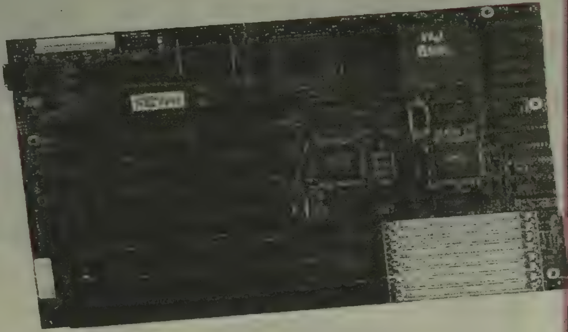

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-2S/1P/1G
-IDE 2F/2D CONTROLLER
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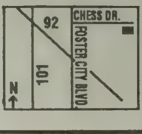

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107651-001 1MB Kit	268
107653-001 4MB Exp Brd	775
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117077-001 512K Module	140
Portable LTE/286	
117081-001 1MB Module	100
117081-002 2MB Module	150
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110235-001 1MB Module	190
110237-001 4MB Module	628
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118304-001 2MB Module	410
118305-001 4MB Module	819
Portable III	
107331-001 512K Kit	98
107332-001 2MB Kit	218

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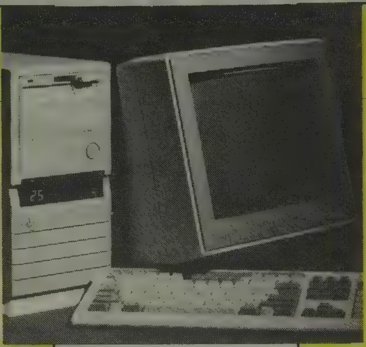

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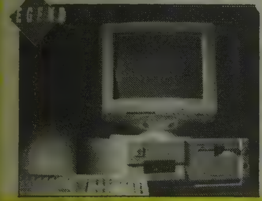

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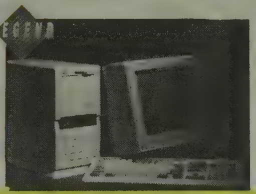

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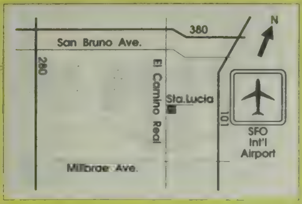

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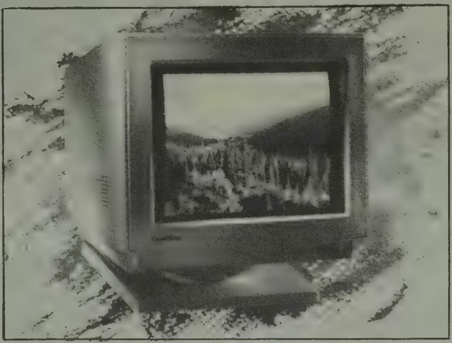

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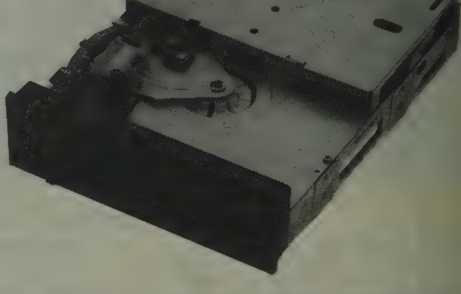

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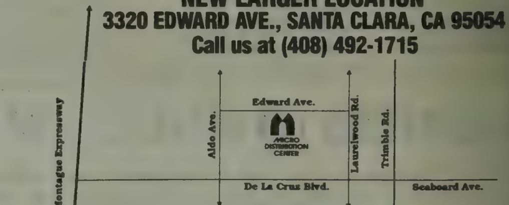
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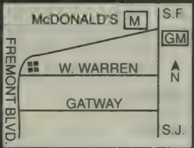

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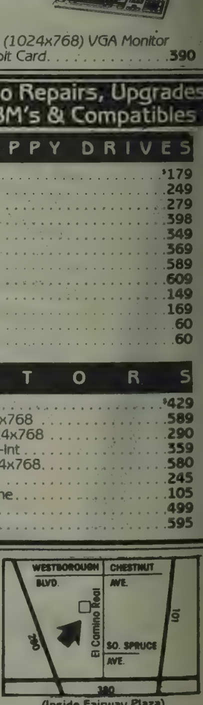

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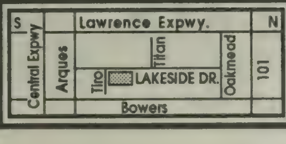

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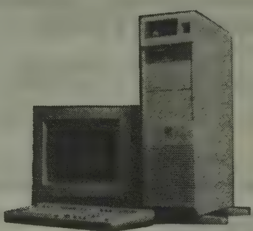

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- Optional 80387SX math co-processor
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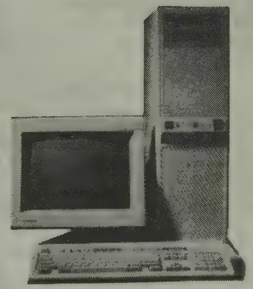
- 2 serial, 1 parallel ports
- Super VGA controller with 1 MB RAM (Resolution 1024x768, 256 color)
- NON-INTERLACED super VGA monitor, 1024x768 dot pitch .28
- Mid tower case with 220W power supply
- 101-key enhanced keyboard



ACR (386-25) $1835

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- 80386-25 MHz CPU
- Optional 80387SX math co-processor
- 64K cache memory
- 4 MB memory on board expandable to 16 MB
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- 2 serial, 1 parallel ports
- Super VGA controller1024x768 with 1 MB RAM
- NON-INTERLACED super VGA monitor, 1024x768 dot pitch .28
- 101-key enhanced keyboard

ACR (386SX-20) $1320

- 80386SX-20 MHz CPU
- Optional 80387SX math co-processor
- 2 MB memory on board expandable to 8 MB
- One 1.44MB 3.5" and 1.2MB 5.25" floppy drive
- 40MB 3.5" IDE hard drive
- 2 serial, 1 parallel ports
- Super VGA controller1024x768 with 512K RAM
- Super VGA monitor, 1024x768 dot pitch .28
- 101-key enhanced keyboard

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-AMI 386/33	985
-AMI 486/33 ISA	1816
-AMI 486/33 EISA	2096
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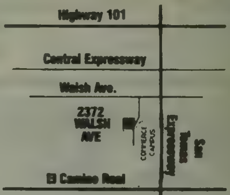

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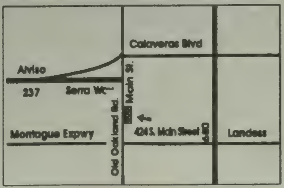

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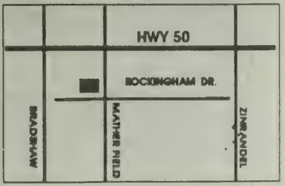

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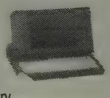

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- 2 Serial, Parallel, Game Port
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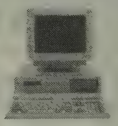

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- AMI BIOS
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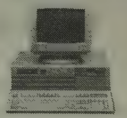
- Teac 1.2 MB or 1.44 MB Floppy
- 2 Serial, Parallel, Game Port
- 101 Keyboard
- Choice: Regular Baby Case or Small Vertical Case



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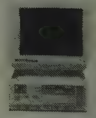
- Choice: Regular Case, Baby Case or Small Vertical Case



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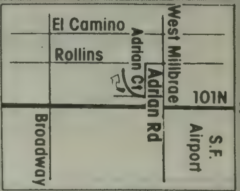

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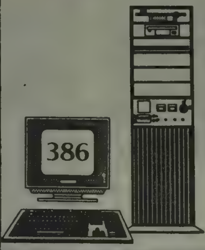

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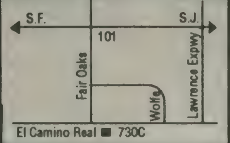

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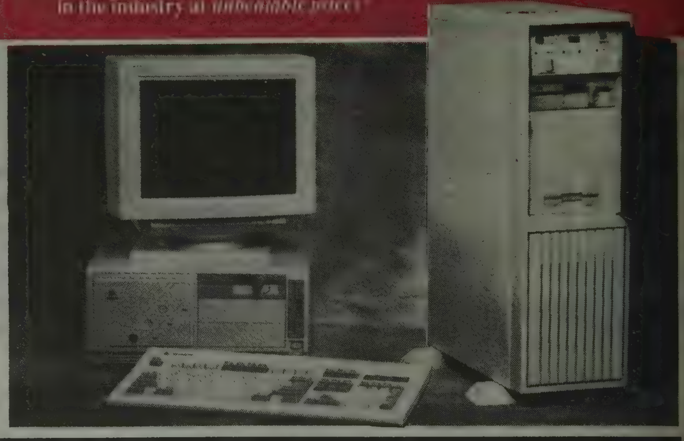

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(*Unless specified differently in Specials)

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(Prices below do not include Hard disk drive, monitor / card)

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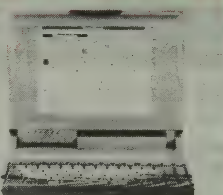

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- 210MB 13ms IDE Hard Drive (Maxtor)
- Orchid ProDesigner IIs VGA card w/1MB
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- 1 P/2 S Ports • Keytronics 101 Kybd (USA)
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- 16-bit SVGA card, 512K
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- Keytronics 101 Keyboard (USA)
- Deluxe Baby Case 200W UL P/S, 6-bays
- MS-DOS 5.0 & MS Window 3.0 and Mouse

MICRO-L 386SX-16 VGA $995

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- 1.2 MB or 1.44MB FDD (TEAC)
- Hard and floppy controller
- 40MB IDE HDD
- 14" VGA Monitor (Relisys RE-9513)
- 16-bit VGA card, 256K
- 1 Parallel/1Game/2 Serial Ports
- Keytronics 101 Keyboard (USA)
- Deluxe Baby Case 200W UL P/S, 6-bays
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386SX/16 mono	$629	$729	$754	$804	$1,004
386SX/16 SVGA	$829	$929	$954	$1,004	$1,204
386SX/20 Mono	$649	$749	$774	$824	$1,024
386SX/20 SVGA	$849	$949	$974	$1,024	$1,224
386/25 Mono	$769	$869	$919	$944	$1,194
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386/40C Hires	$1,209	$1,259	$1,459	$2,159	$2,659
486/25C Hires	$1,559	$1,609	$1,809	$2,509	$3,009
486/33C Hires	$1,609	$1,659	$1,859	$2,559	$3,059

Accessories :

Motherboards : (No CPU,0KB Ram)	
386SX/16 w/CPU	$165
386SX/20 w/CPU	$185
386/25	$120
386/33C (64K Cache)	$175
386/40C (128k Cache)	$200
486DX/25C (256K Cache,ISA)	$325
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80MB Maxtor	$270
105MB Teac	$300
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130MB Maxtor	$340
200MB Conner	$535

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Internal 9600Fax/2400Modem	$89
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Windows 3.0 w/mouse(OEM)	$69
Artec Mouse	$19

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Continued from page 64

if you have sufficient memory.

Even though this is a new product, Hewlett-Packard seems determined to continually improve it. This is the reason for a software upgrade so soon after the introduction of the machine. There is lots of room for improvement. When I mentioned this to HP, they agreed and indicated that this was simply the first try at a product that they feel will become increasingly important in the office environment.

RESOURCES:

LaserJet Fax, $1895
Hewlett-Packard Corp.
19310 Pruneridge Ave.
Cupertino, CA 95014
800-752-0900

WordPerfect 5.1, $495
WordPerfect Corp.
1555 Technology Way
Orem, UT 84057
800-321-4566

FUTURE CAPABILITIES

There are lots of things it would be great for this machine to be able to do someday, but is not yet capable of. For instance, it could double as a scanner. I have also hoped that it would be able to send fax files directly to the computer for storage. But the capabilities for this type of two-way transmission simply does not exist at this time. This will greatly expand the usefulness of this machine, and it seems that the technology is in place so these new functions could be incorporated into future versions of the HP LaserJet Fax.

Another feature I see in the future is the ability to mix computer and hard copy transmission. When this is possible, you could, for instance, generate a cover sheet on the computer and send the body of the transmission from pages you loaded into the LaserJet Fax. Also, you could schedule hard copy transmissions from the computer for delayed transmission. Unfortunately, currently you must either generate the fax completely from the computer or use the machine as a standalone unit. I feel confident that Hewlett-Packard will address this limitation.

> **While the combination of a LaserJet III printer and this fax unit is not significantly more expensive than the standalone laser print plain paper fax, you get a lot more.**

And lastly, I hope for the day that this machine removes the need for a copier. This is only partially true. The LaserJet Fax will make an occasional copy, but it is not an efficient instrument for heavy duty copying. Wouldn't it be a dream to have this machine, coupled with the printer, serve as a full copier? This will have to wait for a major redesign—we would be working with a transport scanner and not a flatbed design.

I tested the HP LaserJet Fax with a LaserJet III printer. This is really a terrific printer, and in conjunction with the fax machine it works like a dream. HP makes a plexiglass accessory stand ($99) that allows you to stack the fax machine on top of the printer. It also catches the papers you transmit after they pass through the scanner.

I regard this as a prototype product and therefore applaud it. As a prototype, it is excellent. But what it points to for the future is truly incredible. ■

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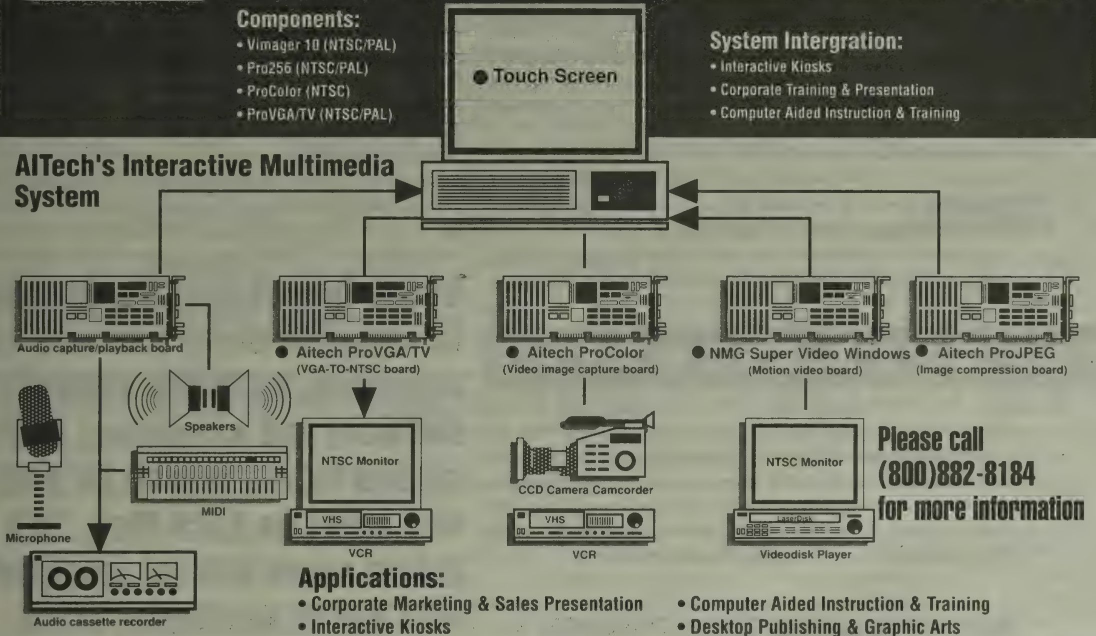
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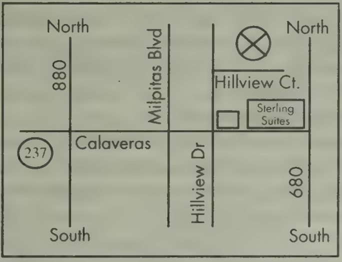
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What's On Your Network?

Reduce Your Upgrade And Configuration Headaches With Network Management Tools

BY WAYNE A. YACCO

Planning to move your large, widely distributed Mac network to System 7? Just think of the fun you're going to have running the compatibility checker on all those computers. Of course, it might not be all fun unless you have a lot of very sophisticated users to collect the data for you, or unless your users are the sort of forgiving, charitable folk who don't mind waiting forever for the network printer, or…well, you get the picture.

On the other hand, you could turn to MacVONK. MacVONK is the developer and purveyor of NetOctopus, a nifty network management system that can be an immense help with any network upgrade—from a single application to a complete operating system.

NetOctopus isn't a network monitor, but it isn't limited to assisting with upgrades either. The information it gathers includes Mac model, processor, math coprocessor, RAM, drive brands and capacities, the number of monitors and their type, keyboard type, and NuBus cards. This information can be used for inventory, maintenance, or trouble shooting. In addition, though, NetOctopus allows you to remotely restart or shut down any Mac on the network. You can even modify the system heap or set the time for these machines.

LOCAL AREA NETWORKS

NETOCTOPUS AND THE TRANSCONTINENTAL MAC NETWORK

Devan Dewey, a senior system analyst at CenterLine Software, has been using NetOctopus for forty-five days—first as a beta site, and, since mid-October, with the currently shipping product. He is currently responsible for administering networks at CenterLine, a developer of UNIX software. His users are running system 6.0.7, and he's preparing to upgrade them all to 7.

The company's ninety LocalTalk workstations are connected at each site by an Ethernet backbone. Fifty to sixty are in a pair of zones in Cambridge, Massachusetts; another ten are in a zone in McLean, Virginia; and fifteen more are in a fourth zone in Mountain View, California. The three offices are connected via an IP Internet (TCP/IP protocol for Ethernet's transport layer). Running the compatibility checker, not to mention upgrading, for all the machines in this network would normally be a complicated pain in the administration.

Copyright © 1991 by Wayne A. Yacco. All rights reserved. An editor, writer, and consultant specializing in microcomputers and their business applications, Wayne Yacco writes articles, columns, and reviews for many trade and business publications. He can be reached at Box 269, Burbank, CA 91503.

Dewey uses NetOctopus information about software and hardware, including system software and extensions in the system folder, to look for problem areas on each Mac. "Believe me, it is a dream come true for someone who has to administer Macs over a 3000-mile area," he says. Users themselves typically have no idea that changes or additions to the files in their system folder—often as a result of running an installation program—can cause them trouble. NetOctopus can detect the introduction of applications that can cause these conflicts. In addition, the software's built-in version of the System 7 compatibility checker lets Dewey check all the Macs on the network for compatibility. He then uses NetOctopus to delete or update conflicting software on the remote Macs.

"This weekend," Dewey told me recently, "I'm going to upgrade all the Macs on the network across the country to the System 7.0 LaserWriter driver so we can begin our migration to System 7." Dewey explained that the reason this preliminary upgrade is so important is that the System 6.0.7 driver and System 7 drivers are not fully compatible. If both drivers are on the network together, a printer reset occurs every time there is a driver change between jobs. Each reset takes from two to three minutes—more time than many short jobs.

> **Devan Dewey uses NetOctopus information about software and hardware, including system software and extensions in the system folder, to look for problem areas on each Mac. "It's a dream come true for someone who has to administer Macs over a 3000-mile area," he says.**

Another use for NetOctopus is finding dirty ROMs or applications that are incompatible with the system's 32-bit addressing mode. The administrator can let a user know if he or she needs to turn the 32-bit mode off to run an incompatible application like MS Excel 3.0.

The program's features can also be employed remotely via asynchronous communications, using software like Apple's new AppleTalk Remote Access or Shiva's Dial-In Access. Dial-In is bundled with Shiva modems including the NetModem/E (which can connect the remote Mac running NetOctopus directly into the network).

Security functions are built into NetOctopus. Its user inits are serialized. This keeps any unauthorized version of NetOctopus from controlling the network. Furthermore, the application has the ability to enable sub-administrators—each with their own level of access and privileges. Separate administrators can be assigned to each zone or to groups of individual users.

The NetOctopus database can also be exported for analysis with other software, or presented in printed reports. The program can generate tab-delimited files for importation into other databases or into spreadsheet applications. Its templates allow you to put any mix

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of NetOctopus information into custom reports.

PC CENSUS

Similar applications are available for the IBM PC and compatibles. PC Census, for instance, offers comprehensive tools for acquiring and maintaining inventory data. Unfortunately, it doesn't have NetOctopus's ability to control nodes, manage files, or update software over the network.

Larry Dubisz, a resource analyst, is using PC Census at one of the nation's top ten life insurance companies to plan the creation of a network that will replace host-connectivity. The present system consists of 3270 PS/2s connected to an IBM 3090 model 720J through 3174 control units. The system which will replace it will be a token ring network with departmental servers. Eighty-five to 90% of the nodes will still access the mainframe.

Between five hundred and eight hundred machines located in the Illinois-based insurer's five-story corporate facility will be involved. The network will use existing twisted pairs in the building's wiring closets to connect the system throughout the four wings on each floor. Fiber optics will connect the floors to each other and to a main computer center located in a second facility across a street.

Dubisz uses PC Census to detect DCA Irma cards, token-ring cards, and software on the machines to be converted. "Someone's going to come to me and say, 'I'd like to be connected to the mainframe.' Unfortunately, there's a lot of people out there who don't know what kind of configuration they have. They don't even know if there's an available expansion slot. You should see the expression on their face when I pull down all the details. I know more about the system they use every day than they do."

He is also concerned about detecting software that could introduce viral attacks. However, his biggest concern is user changes that could affect system integrity through operational conflicts. "We've had some situations already where someone's had a problem with their system, and we'll give them a new configuration," says Dubisz. "If it isn't done right, that can degrade the whole network." He points out that there is a much greater danger of this occurring if users add software or hardware on their own. Many installation programs modify CONFIG.SYS or other system files. The costs imposed by these conflicts quickly add up: time to debug, involvement of outside support providers, and the loss of the network to other users.

RESOURCES:

NetOctopus: Licensed for 10 nodes, with "unlimited" administrators (100), for $645. Additional sets of 5 users are $275. Site licences are available for 50 nodes and up.

MacVONK
313 Iona Ave.
Narberth, PA 19072
(215)660-0606

PC Census: $14.40/pc for 100–300, until 12/1/91. Thereafter, $15.75/pc for 100–200. Declining rate for bigger licenses. Consolidator: $495.

Tally Systems
Buck Rd.
Hanover, NH 03755
(603)643-1300

Dubisz currently collects data by popping a diskette into each machine. The data is then transferred into the database in the administrator's workstation. When he upgrades to v3.0 (which has just shipped) he'll be able to do everything over a Novell network. Banyan Vines support is being added. However, users must still manually enter things like printer; monitor; user's name, phone number, and mail stop; node name; token-ring address; or an optional note field.

PC Census is written in dBASE, so its files can be queried by dBASE as well as compatible applications like FoxBase, Paradox, and Concentric Data Systems' R & R Report Writer. Import/export facilities also let you work with software that doesn't directly support dBASE files through comma-delimited files.

Standard reports include the following:

- Configuration report. This report lists each machine, processor, response time, memory, adapters, drives, and port connections.
- Product account report. Reports on specific software or hardware. For example, a report could disclose the types, numbers, and versions of all spreadsheets.
- Inventory change report. This indicates individual items that have changed since the last inventory, including directories or software that has been added. It can be used to control software piracy, or to detect the introduction of potential virus carriers.
- Mapping report. This report lists devices, like network cards, that are address dependent.

A complementary program, the Consolidator, lets you inventory your own site plus licensed PCs from other sites. This application lets you have delegated controls over network segments as well as a consolidated database for centralized control of the entire network.

The PC Census license provides the first year of support (18% of license cost per year thereafter). Support includes unlimited phone support and major upgrades. It also provides updates to both CPU and software fingerprinting: the method that PC Census uses to detect resources. If the program fails to identify a resource, Tally will add it to the database for you. ■

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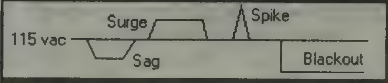

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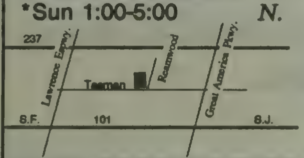

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Electronic Mail

The Medium Is The Malaise

BY BENNETT FALK

For the first time in nearly ten years of using UNIX, I've begun to find electronic mail unappealing.

Ten years is a long time to use any piece of software, and no doubt many people have become disenchanted with email in much less time. It's just that I never expected to be a victim of disenchantment at all, so it's important to understand why email, generally a useful tool, has become so burdensome.

The UNIX "mail" command is the primary vehicle for communications among the people who use UNIX-based computers. It is the heart of the UNIX system, being at once an office automation tool, a laboratory for studying the technical issues of computer networking, and a means of building a human community. The fact that mail, in spite of all its benefits and points of interest, is becoming a nuisance in my daily life is a bad thing.

UNDERSTANDING "MAIL"

The basic contribution of email is the ability to communicate with other users "asynchronously." One user sends others a piece of mail. Recipients can read and respond at their convenience. The participants don't have to meet face to face.

UNIX

Indeed, as UNIX mail has developed, the participants don't even have to be on the same computer, or the same LAN. All that is needed for UNIX users around the world to exchange mail is a known route through machines that call each other and exchange messages.

The basics of sending and receiving mail are straightforward. To receive mail a user simply types "mail"; if there are messages for that user, they will be displayed. The command "mail username" is used to send mail to the UNIX login "username." After issuing this command, the text of the mail message can be entered directly. The end of the input is usually signaled by typing control-D.

There is much more to using mail than is evident from this short description, but there is no need to master the more advanced features just to exchange mail with other users.

Copyright © 1991 by Bennett Falk. All rights reserved. *Bennett Falk lives in the Bay Area, writes when he can, and hopes for the best. He works for Sybase, but the opinions and attitudes expressed are his own.*

THE DELUGE

What has made mail so unappealing lately is a massive backlog of incoming messages. Throughout the workday, messages arrive in my system mailbox, as they have for the last decade. As always, I try to read and respond to them. From past experience I expect to keep anywhere from ten to forty messages in my system mailbox for various reasons. Lately, this backlog has skyrocketed to 140 messages.

With this sort of backlog the mail program becomes cumbersome to use, and this only makes it more difficult to respond to incoming messages. Eventually, people arrive in my office to engage in synchronous, face-to-face communication. Have I received their mail, they ask. Inevitably I respond peevishly: Of course, the mail was received, I just haven't gotten around to doing anything with it. And the social fabric unravels just a bit more.

WHAT'S THE PROBLEM?

Is this just a volume problem? There are, after all, about 1200 people who could send me work-related mail. In a one-day survey of mail traffic, seventy-four new messages arrived in my system mailbox. But those messages were from only fifteen different senders, and that suggests that the problem is not really a volume problem at all.

Looking more closely at this day's worth of new mail, I discovered it was possible to group the new messages into several categories. Sixteen of them were information about a project I'm working on. Thirteen were about social matters (Can we get pastries delivered? If so, what do we want? Has so-and-so's stolen car been recovered? Will there be a party after work?). Twelve were about administrative things. Eleven were general technical questions. Six were notices about the whereabouts of my co-workers. Five were requests for product information, four were requests for pre-sales help. Two were public recognitions of jobs well done. Two requested an opinion, two were about upcoming events. One was about training. Most of these categories are things I have some interest in, and while some of the messages are annoying, it's not clear that anyone is abusing email in sending them.

Finally, I looked at who the messages were addressed to. Of the seventy-four messages only six were addressed to me personally. The rest were addressed to distribution lists that I belong to.

Mailing to a distribution list can be a very useful thing, but it

> **What remains is the hope that there is some sort of technical solution to this problem, some way to put off email burnout by better screening of incoming mail. Right now, after several readings of the manual, this is still just a hope.**

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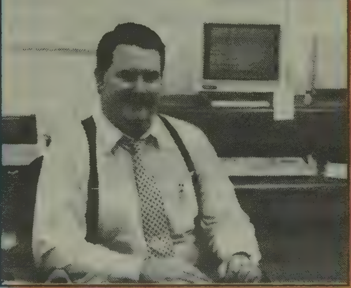

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imposes some degree of anonymity on the communication. The person who sends a question out to a distribution list containing hundreds of names apparently doesn't care who the answer comes from—any answer is better than none. When advisory mail is sent to a distribution list, the sender will probably not know what significance (if any) the message has for its recipients. In any event, the senders may not even know who the recipients are.

As the exchange of information in email becomes less personal, it begins to resemble transactions that might occur in a database. (A lot of the mail in my backlog is actually formatted to look like database records.)

But, however much email can be made to look like database activity, the two are fundamentally different. Email is a medium for distributing information, and is essentially under the control of the sender. Databases are instruments of information retrieval and work at the initiative of the receiver.

The challenge in sending email is part timing (providing information at the right time) and part composition (providing everything the recipient needs to understand the message). Querying a database is relatively free of these constraints: The user queries the database when the information is needed and can usually construct enough context to make sense of whatever is retrieved.

Many of the backlogged messages in my mail box fit this pattern. I can't tell from the text if the message is deletable. It has arrived at a time when I can't tell if it's significant or not. My response is to wait for it to become significant. If it doesn't do that in a week or two, it will be deleted. In the meantime however, it is just another obstacle in my system mailbox.

NO EASY SOLUTIONS

There are several ways to deal with this set of problems. One is to resign from various distribution lists, but this is unfriendly and ultimately an admission that email just doesn't work.

Another is to educate the senders of email about what is appropriate to the medium and what is not. As a proponent of the doctrine of Original Sin, I don't hold much hope for this alternative, and after all, email is still easier to use than most database management software.

What remains is the hope that there is some sort of technical solution to this problem, some way to put off email burnout by better screening of incoming mail. Right now, after several readings of the manual, this is still just a hope. Many of the commands that can be invoked while reading mail can be applied to a message list, and this is useful for processing groups of messages. The Berkeley UNIX version of mail supports saving messages grouped by sender or by the occurrence of some pattern in the subject line of the message. (I just saved all the Shipping Release Forms [SRFs] in a folder of their own and got rid of twelve of my 140 messages.)

What would be really neat is the ability to group messages by addressee, so each distribution list could have a folder of its own where messages to that list could age while I figured out what to do with them. It doesn't look like this feature exists, but I'm still looking. If you find it before I do, you could always send mail to *rosebody@well.sf.ca.us.* ■

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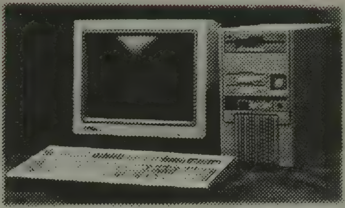

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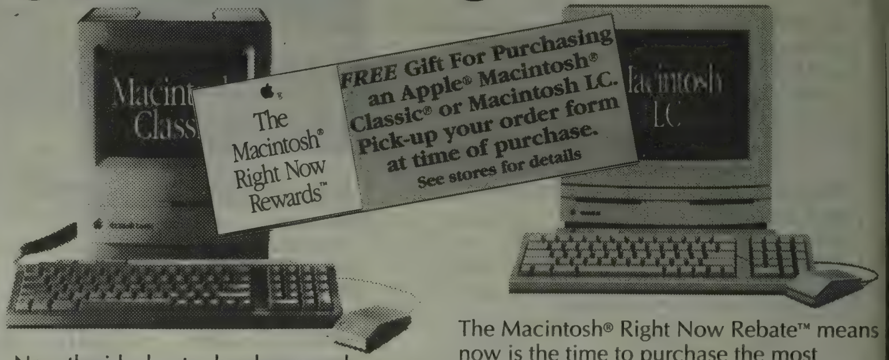

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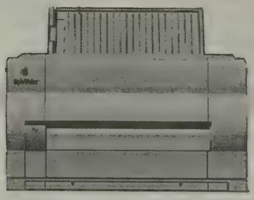

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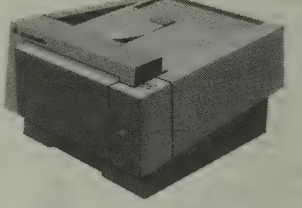

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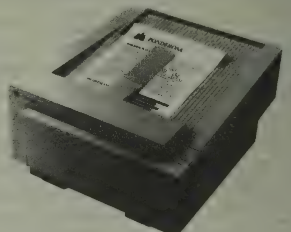

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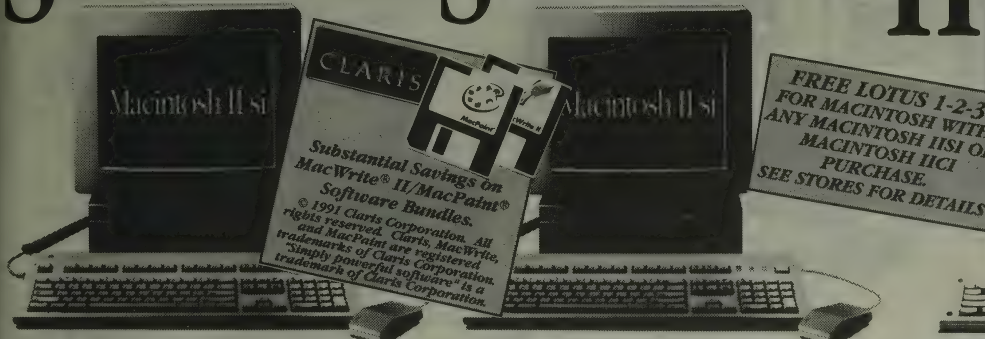

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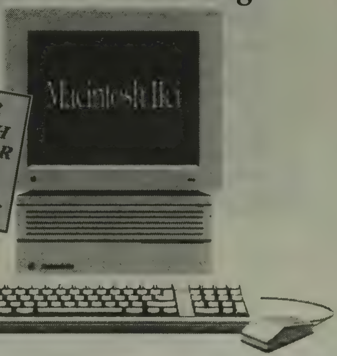

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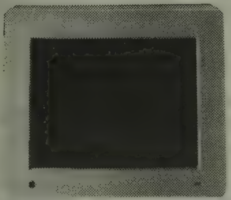

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- Scalable Hobo Medium and Signet Roundhand typefaces add personality to your specialty documents.

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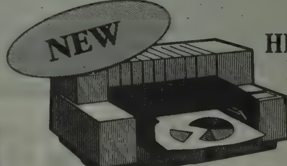
"HP Leads the Revolution in Resolution"

HP DeskJet 500 Printer

- Improved print quality
- Added internal fonts
- 3 year warranty
- Water resistant ink cartridges.

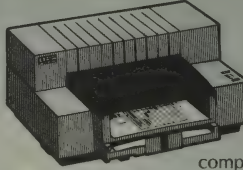
399.



HP DeskJet 500C Printer

- Affordable laser-quality printing
- 300-dpi color printing on plain and transparencies
- Supports leading software applications including Windows 3.0
- 3-year limited warranty

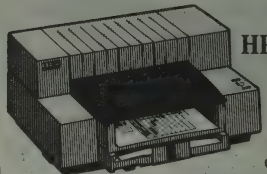
849.



HP DeskWriter Printer

Hewlett-Packard's DeskWriter printer, now AppleTalk® compatible, brings laser-like quality to the Macintosh® line.

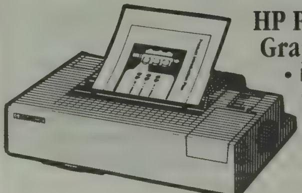
399.



HP DeskWriter C Printer

The new HP DeskWriter C adds color capacity to an already famous laser-quality black output. It's compatible with popular Macintosh® software and your budget.

849.

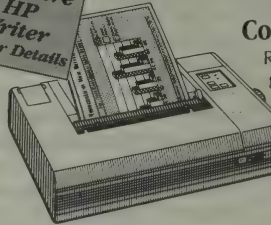


HP PaintJet Color Graphics Printer

- High quality color charts & graphics
- PC or Macintosh® compatible
- Wide range of software support.

749.

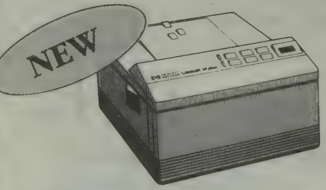
FREE Software with HP PaintWriter
See Stores for Details



Color Me Brilliant HP PaintWriter

Reports and presentations achieve their greatest impact in color produced by the HP PaintWriter printer. Prints on paper or transparency for maximum versatility. Compatible with Macintosh® color computers.

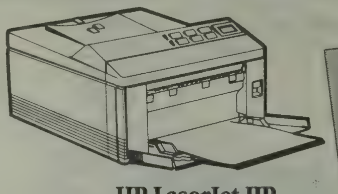
749.



HP LaserJet IIP *plus* Printer

- High-quality, 300 dpi text and graphics
- Compact, desktop size
- Prints 4 pages per minute
- Compatible with all major software packages
- Optional 250-sheet paper cassette for dual-bin printing

829.

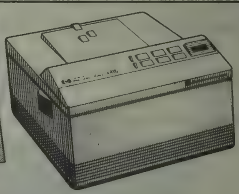


HP LaserJet IIP PostScript Printer

- Mac or IBM compatible
- True Adobe® PostScript with 35 typefaces
- Built-in LocalTalk interface
- Easy to use—"plug and play"
- Compact, desktop size

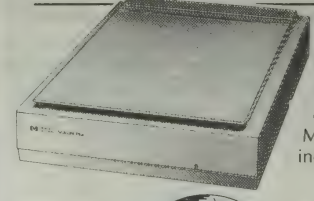
1749.

FREE Software with any HP LaserJet PostScript® Printer for Macintosh
See Stores for Details



HP LaserJet IIIP PostScript Printer

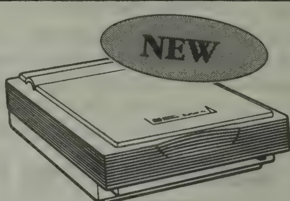
- Resolution Enhancement technology for print quality superior to ordinary 300-dpi laser print-ing
- True Adobe PostScript® with 35 typefaces
- Mac or IBM compatible
- Built-in LocalTalk interface for easy "plug & play"
- Compact, desktop size



HP ScanJet Plus Scanner

- 256 grey scale levels (8 bit) for high-resolution images
- Wide range of contrast & intensity control
- PC or Macintosh® compatible
- Price includes interface.

1149.



HP ScanJet IIc

The new HP ScanJet IIc gives you 256 levels of gray or 24-bit color professional quality documents. Supports IBM AT-compatible PCs, MicroChannel or Macintosh® personal computers.

Starting At 1495.

Price includes interface

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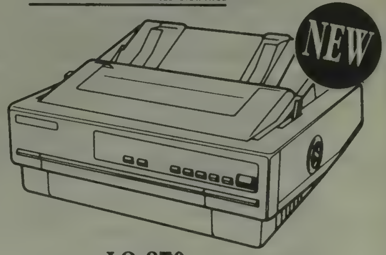
EPSON®

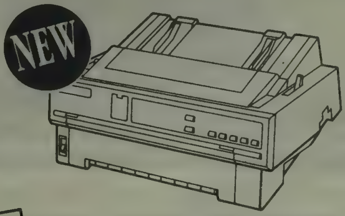
ESC/P2™ EPSON SCALABLE FONTS • ENHANCED GRAPHICS

LQ-570

This new 24 pin printer utilizes scalable fonts, enhanced graphics and advanced paper handling to offer more performance than any printer in its class at an affordable price.

279.





LQ-870

This new 24 pin printer is a major step forward in printer technology with high speed, and high performance that sets a new industry standard for quality with scalable fonts.

489.

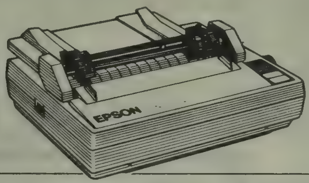
LQ-1170 Wide Carriage Model.......**699.**

TWO YEAR WARRANTY ON ALL EPSON PRINTERS

LX-810

- 9 pin • SmartPark™ paper handling
- 200 CPS super draft • 30 CPS NLQ
- High resolution graphics.

159.



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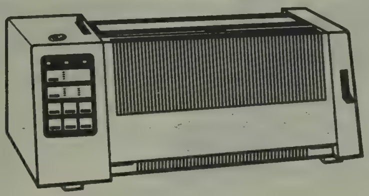
NEW PRINTERS FROM IBM®

IBM® PPSII 2380

IBM introduces 2 new 9 pin printers that can print crisp, six -part forms and thick paper stock with no problem using straight paper path technology. Solid and reliable, these printers perform flawlessly.

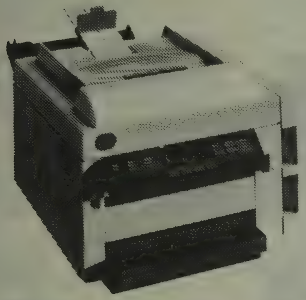
2380 Narrow Carriage ......**349.**
2381Wide Carriage...........**499.**



IBM® PPSII 2390

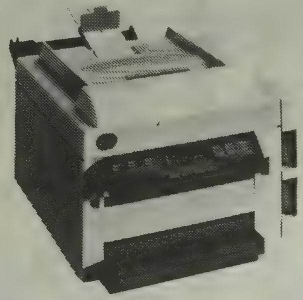
IBM introduces 2 new 24 pin printers for letter quality printing at high speed. Durable and reliable, these printers feature a straight through paper path with multiple feed options.

2390 Narrow Carriage ......**359.**
2391Wide Carriage............**509.**



IBM® LaserPrinters 6 & 10

At 6 or 10 pages per minute with Print Quality Enhancement and Scalable Fonts, these printers outperform the rest. Paper handling includes a 200 sheet input tray with optional 500 sheet drawer and 75 piece envelope feeder. When you add the optional PostScript™ and 4 MB of memory this printer provides the most affordable 600 x 600 dots per inch technology available today. HP PCL4 compatible and optional PCL5.



IBM® LaserPrinter 6
6 pages per minute
Model 4029020

1495.

IBM® LaserPrinter 10
10 pages per minute
Model 4029030

1795.

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The new IBM PS/1 386 SX achieves the exceptional. A home machine with the power of a business model, this computer operates at 16 mhz with 2 MB's of RAM. A 40 MB hard drive stores all your essential data. Comes complete with VGA PhotoGraphic™ color display, keyboard, mouse and built in 2400b modem. Plus you get IBM DOS, Microsoft Works® and 3 months FREE Prodigy for on line home shopping, banking, travel arrangements and more.

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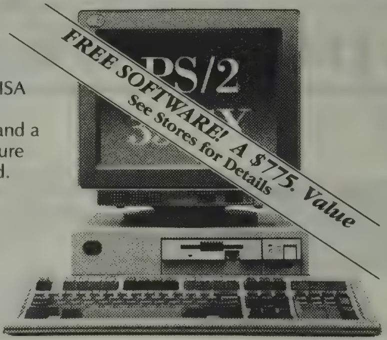
PS/2 NOW AVAILABLE IN ALL STORES

IBM® PS/2® 35sx

Based on an 80386sx processor operating at 20 Mhz, this latest model IBM PC offers the classic ISA buss allowing easy upgrades at reasonable cost. 2 MB of RAM and a fast 17 MS 40 MB hard drive insure top performance. VGA on board.

Monitor extra.

1649.*

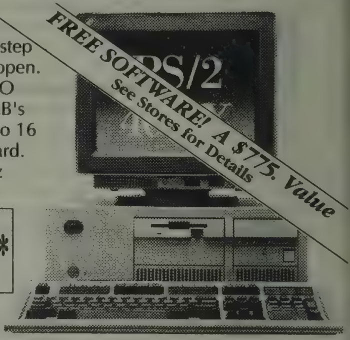


IBM® PS/2® 40sx

For more expansion capabilities step up to the PS/2 40sx with 5 slots open. VGA hard drive controller and I/O are all on the motherboard. 2 MB's of RAM come standard with up to 16 MB maximum on the system board. An 80386sx operating at 20 Mhz speeds every operation along.

Monitor extra.

1895.*



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PS/2
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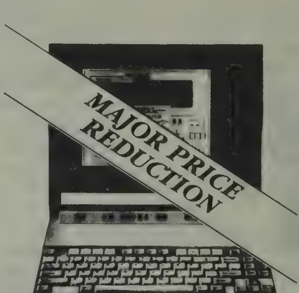
IBM® PS/2® 55sx

IBM's best selling PC is now available at a very special price. 2 MB's of RAM, VGA on board and a 30 or 60 MB hard drive make this system a hot home or home office unit.

Monitor extra.

STARTING AT **1595.**



IBM® PS/2® L40sx

Full featured, fast and flexible, the L40sx is IBM's new no compromise notebook PC. 2 MB of RAM expandable to 18 MB , VGA display, 20 Mhz 80386sx processor and 60 MB hard drive make this system an outstanding choice for the business traveler.

2999.

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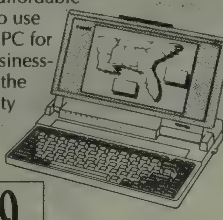
TOSHIBA NOTEBOOKS

Toshiba T1000 SE

Toshiba's affordable and easy to use Notebook PC for today's business-person on the move.Plenty of comfortable features.



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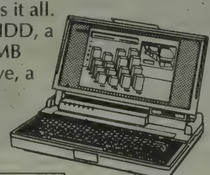
Toshiba T1000LE

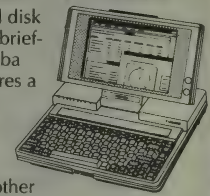
Toshiba's 6.5 pound notebook PC that has it all. A 20MB HDD, a 3.5"/1.44MB floppy drive, a terrific display and keyboard.



1399.

Power Packed T1200XE/40

Carry 286 hard disk power in your brief-case.The Toshiba T1200XE features a large, bright display, a comfortable keyboard as well as many other performance features to enhance your productivity.



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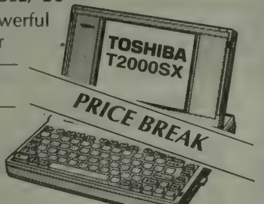
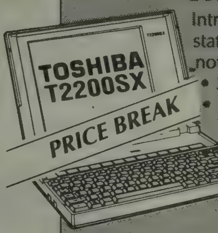
Toshiba T2000SX/40

- Toshiba's most powerful notebook computer
- High performance—386SX™ processor
- Super ergonomics—only 6.9 lbs.



2299.

Toshiba T2200SX/40



Introducing the T2200SX—state-of-the-art features in a 5.5 pound notebook format!

- 20 MHz, 386™SX processor
- 40 MB or 60 MB hard drive
- 1.44 MB diskette drive
- 2 MB RAM expandable to 10 MB
- VGA display with 16 gray scales

3199.

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*Cables Included

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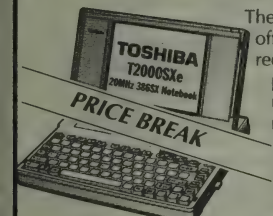
Toshiba T2000SXe/60



The Toshiba T2000SXe/60 offers advanced features required by business and professional power users. Time now to replace your desktop.

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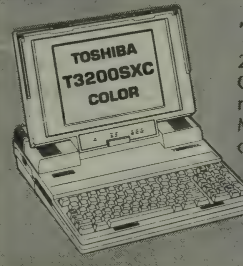

Toshiba T3200SXC

20 MHz 80386™SX CPU. Color TFT-LCD active matrix VGA display. 120 MB hard disk drive. See one in our Berkeley Store.

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Put the total Windows™ computing solution to work for you.

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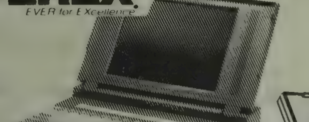

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"Deskless Computing"

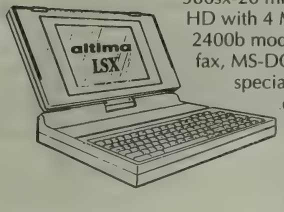
•Low in weight and high in power the Tempo LX 20 mhz 386sx notebook frees you from the bonds of your desk. Comes complete with VGA graphics, 1 MB RAM expandable to 5 MBs and a 60 MB Hard Drive

2195.

altima LSX

Award Winning

386sx-20 mhz, 60 MB HD with 4 MB RAM, 2400b modem/send fax, MS-DOS 5.0 and special software collection consisting of six titles.

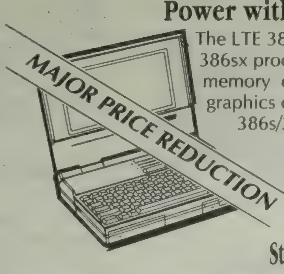


2895.

COMPAQ

COMPAQ LTE 386s/20

Power without the Pounds



The LTE 386s/20 uses a 20 mhz 386sx processor with cache memory design and a 16 bit graphics controller, the LTE 386s/20 packages this optimal performance in a 8.5 by 11 inch PC weighing 7.5 lbs.

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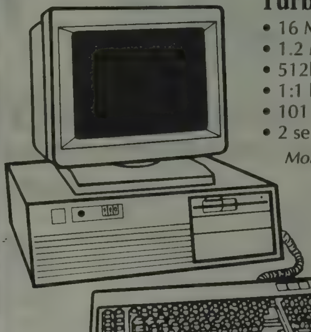

Turbo 286 16

- 16 Mhz 80286
- 1.2 MB floppy
- 512k RAM
- 1:1 hard drive controller IDE
- 101 keyboard
- 2 serial 1 parallel port

Monitor, display card extra

499.

386SX

- 16Mhz 386SX
- 1 MB RAM
- 1.2 MB floppy
- 1:1 hard drive controller IDE
- 101 keyboard
- 2 serial 1 parallel port

595.

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by Lucasfilms ™ Games
FREE with Purchase of a
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while supply lasts.
*CPU and Monitor

386/33 Mhz

- 1 MB RAM
- 1.2 MB floppy drive
- 1:1 hard drive controller IDE
- 64k cache
- 101 keyboard

895.

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WEA 486-33 Standard

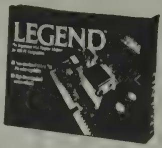
• 4MB RAM upgradable to 8 MB on motherboard; • I/O, 1.2 MB FD, 101 keyboard • 1:1 hard drive controller IDE • Desktop case • AMI BIOS • 64 K RAM cache, upgradable to 256K • 1-32/8 bit slot • 6-16 bit slot • 1-8 bit slot • Weitek math co-processor socket.

1999.

Ad expires 11/30/91. Limited to stock on hand. Errors subject to correction.

SIGMA DESIGNS

Sigma VGA Legend

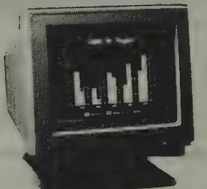


- 1024 x 768 • 16 colors
- Interlaced or non-interlaced
- No switches or jumpers
- 512 K video memory upgradable to 1 MB
- Exceeds European ergonomic standards for flicker-free displays
- Upgrade kits in stock (VGA CARD ONLY)

219.

Leading Technology 12" Amber Monochrome

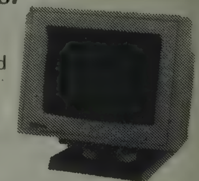
• Non- glare • 720h x 350v with tilt & swivel and cable



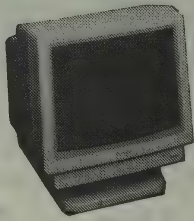
99.

Leading Technology 1480A

• 14" amber flat screen 720h x 350v with tilt and swivel.



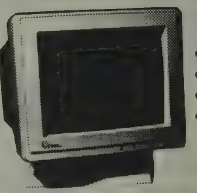
119.



Leading Technology 1458V

14" analog multi-frequency 640 x 480, .51 mm dot pitch

299.



STANDARD TECHNOLOGIES

STA-428I

- 14" Super VGA color
- .28 dot pitch
- Includes tilt & swivel base
- 1024 x 768

349.

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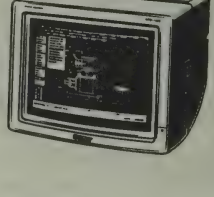
SONY

Sony 1320 VGA

- VGA color monitor
- Analog input
- .25mm aperture grid



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Picture Perfect

Ideas spring to life in sharp vivid color on this advanced Sony monitor. Sony combines non-interlaced technology with a super fine pitch grille to achieve sharper images without flicker. Compatible with Macintosh·
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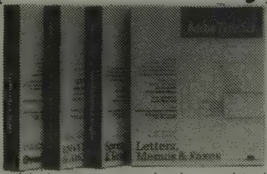

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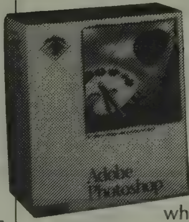

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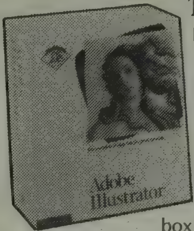

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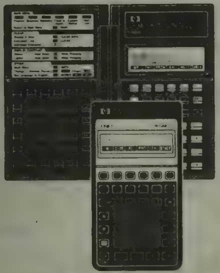

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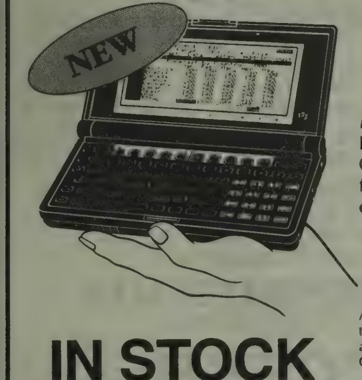

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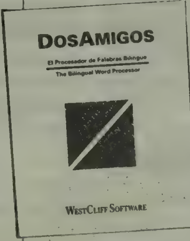
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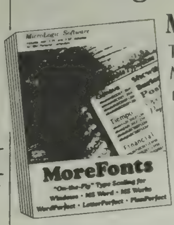
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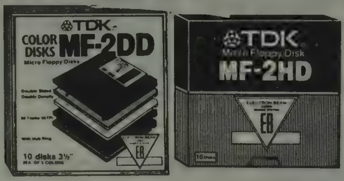

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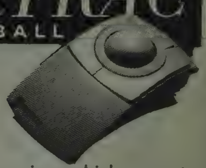

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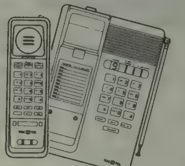

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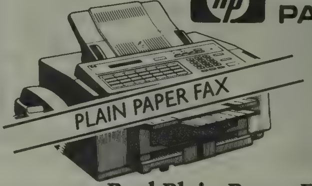

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Financial Organization Made Easy With Money

Microsoft Money For Windows Provides The Tools To Track Where Your Money Is Going

BY WOODY LISWOOD

If you have been waiting for a checkbook program with the ease-of-use of Quicken and the functionality of Windows, wait no longer. Money is an excellent checkbook program, with lots of bells and whistles to help you in managing, controlling, and understanding your financial life.

With Quicken being the DOS standard for these types of programs, Money would start out poorly if it did not import Quicken files. It does. Using Quicken's data interchange format, you export your files out of Quicken and load them into Money. I did this and had no problems at all.

Having used Quicken for years, I expected that I would have to learn new habits to run Money. To my surprise, Money was obvious to me from the start.

I quickly found myself enamored with one of Money's features—SmartFill. As you entered your payees and categories, Money remembers what they are. The next time you start to enter them, Money watches your keystrokes and as soon as the entry becomes unique, it completes the typing for you. A great idea. Money also places the last amount you paid for that payee in the check column. Although you can easily type over it, I found it a bit disconcerting for home finances. With only a few regular exceptions, like our house payment and insurance payments, our checks vary each time. All in all, I really like the feature, but I do have to pay attention and not let Money outsmart me.

Money allows the management of traditional accounts such as checking accounts. It also handles other types of bank accounts as well as savings, money-market, credit card, cash, asset, and liability accounts.

In case you need some help getting started, Money includes a variety of categories already set up, depending on whether you use Money to monitor your personal or business accounts, or you combine them.

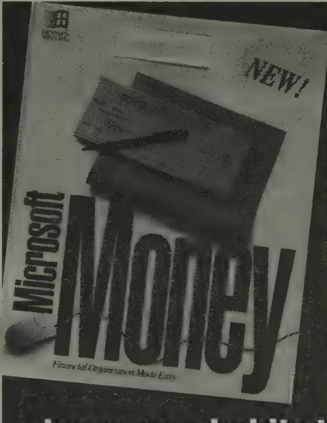
Data entry is flexible. You can enter data using a check register type of view or you can have Money display a check on the screen and you just fill in the blanks. Both work.

Since checkbook programs have been around for a long time, I will not take up space by mentioning every thing you can do. You can do what needs to get done: split transactions, combine transactions, print checks, schedule payments, and reconcile down to the penny.

Reconciliation even has some help, not suprisingly called SmartReconcile. If, after you've done everything and are still off, Money will use some smarts of its own to help find the error. It will help you look for things such as misplaced decimals or transposed digits. If, after all that, you still don't balance, Money will automatically adjust the account balance for you.

Reporting is also up to par. There are a variety of preplanned reports as well as the ability to modify and create custom reports.

And, after you finish, as you exit, Money asks if you want to back up the data files to a floppy drive. You do do backups, don't you?



Having used Quicken for years, I expected that I would have to learn new habits to run Money. To my surprise, Money was obvious to me from the start.

There is also a full set of editing features you can customize by adding or deleting categories. You can also look at your payee list and edit it as well. You can even add a new payee name before you write your first check to them so that all the data will be there when you start to do your entry.

Managing special accounts will take some thought, but will be easy if you are willing to put in the time and energy to keep things running smoothly. The documentation has clear instructions for everything from cash accounts to investments, and even your home mortgage. Why, you might ask, would you want to track the details of your home mortgage in Money? Well, so you can have a current net worth calculated for you upon demand. Remember, with each payment, your loan is paid off by a few bucks, and your net worth is increased by those same few dollars.

While money will not replace a traditional full-featured accounting or bookkeeping program for businesses demanding a double-entry system, Money can go a long, long way in organizing your home finances and many small businesses.

The Windows interface makes working with Money a snap. The documentation explains how to do the odd things, like accounts payable and receivable. Another valuable addition to the Microsoft solution series. Well done, folks! ■

RESOURCES:

Money, $69.95
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A Notebook You Can Really Write On—And Run Lotus, Too

Momenta Unveils The "Pentop" Computer

STORY BY MARY EISENHART

On October 7th, amid much elaborate hoopla at the Santa Clara Convention Center, a previously close-mouthed Mountain View startup called Momenta unveiled its first product. Shortly thereafter, Momenta figured prominently in press coverage of COMDEX as one of the few genuinely interesting vendors and products on the scene.

The product: a 386-based notebook computer with a difference—a screen you can write on. Currently shipping in an LCD version with a backlit model due in February, the Momenta "pentop" bridges the gap between the coming crop of pen-input computers and current standards: It runs MS-DOS and Windows, and will support pen enhancements to the latter as Microsoft makes them available. It also includes its own Smalltalk-based environment, containing bundled applications that let even the computer illiterate user do useful work within minutes of unpacking the machine, without acquiring a single DOS application.

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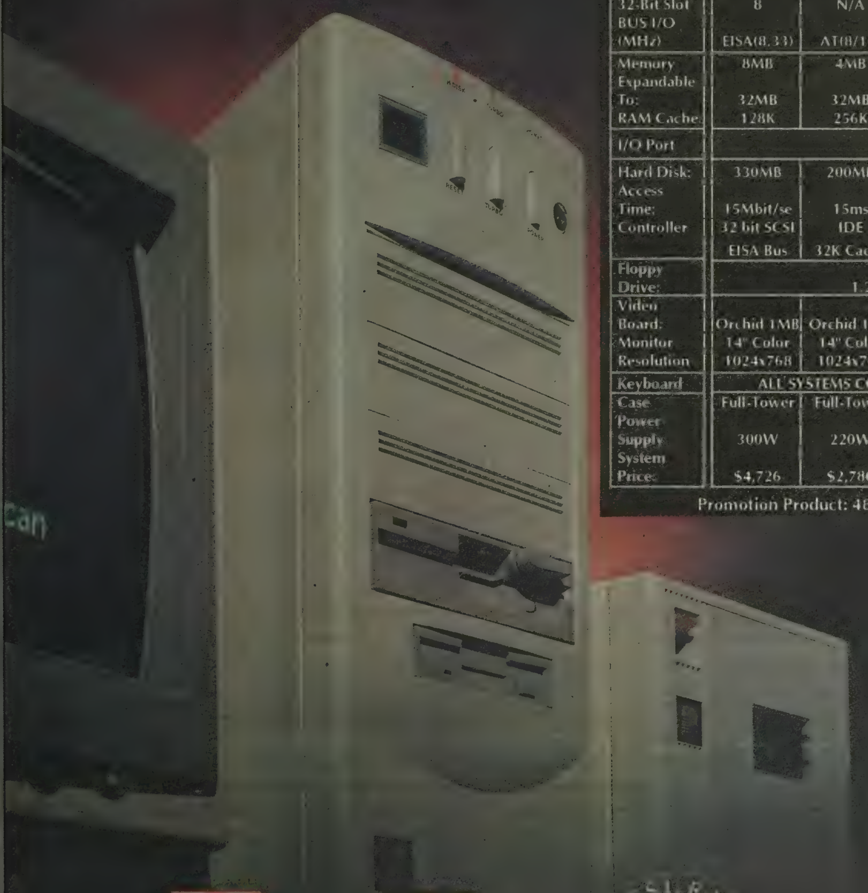

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BIOS	Mylex	AMI	AMI	AMI	AMI	AMI
Numeric Support:	Built-in	Built-in	Cyrix	Cyrix/Intel	Cyrix 387SX	387SX
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16-Bit Slot	N/A	8	5	5	4	4
32-Bit Slot	8	N/A	1	1	0	0
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Memory	8MB	4MB	4MB	4MB	2MB	1MB
Expandable To:	32MB	32MB	16MB	16MB	16MB	16MB
RAM Cache	128K	256K	128K	128K	64K	N/A
I/O Port	2 Serial, 1 Parallel					
Hard Disk:	330MB	200MB	130MB	80MB	52MB	40MB
Access Time:	15Mbit/se	15ms	15ms	17ms	17ms	28ms
Controller	32 bit SCSI EISA Bus	IDE 32K Cache	IDE 64K Cache	IDE 32K Cache	IDE 64K Cache	IDE 1:1
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Along the way, Momenta's founders made some interesting design choices to bridge the gap between current and future technologies. Diverging from the usual design of pen-input machines, they made the keyboard (a decent-sized one at that) an integral part of the machine design, but detachable so the user could take the screen/computer into meetings and other keyboard-impaired situations and use the machine as a notepad.

They also acknowledged the limitations of current handwriting recognition technology by building into the machine a "command compass"—a pie-chart-like menu containing functions like Copy, Move, Paste, etc., which can be called up from anywhere in the system and simply tapped to produce the desired effect. In the course of developing the machine, Momenta's engineers found a wide variance among different users as to which gestures were "intuitive," and also enough variance as to how the same user made the same gesture that it seemed wise to have a standard interface for commonly used commands. Says software development director Beatriz Infante: "We felt that the command and control of the machine had to be 100%. Given today's technology, and probably any technology for the next five years, you're not ever going to get 100%. The problem with failures with command and control is that it leads to great inefficiencies in using the machine, because you then start developing a lack of confidence."

Founded in 1989 by entrepreneur Kamran Elahian, who had previously cofounded CAE Systems and Cirrus Logic, Momenta is a truly international startup, with investors from the US, Asia, Europe, and the Middle East. The machines are manufactured in Singapore, and the government of Singapore is one of the company's investors. Says marketing vice president John Rizzo (no stranger to revolutionary-interface computing, having been the product marketing manager for Macintosh in 1984 and 1985): "We're manufactured in Singapore for a very simple reason. We think that this market is very cost-competitive, and if we have the greatest technology in the world and are too expensive, we're going to be out of the market. So we're producing it in a low-cost capitaland labor market. Singapore and Thailand and Malaysia have extremely well established surface-mount production lines, and very low cost of capital and cost of labor. And because we have investors from those markets, we can get some very favorable tax credits."

Unlike currently available pen-input systems, which address mostly vertical markets, Momenta targets a broad user base of people who use computers in their work, run many applications, and need to take the computer wherever they go. At $4995 list ($5495 for the backlit model due in February), the machine is competitively priced with other vendors' 386SX notebooks. Momenta hopes the pentop's additional capabilities make it the new professional's choice.

The Vision

Kamran Elahian, President and CEO

Why did you decide to start Momenta?

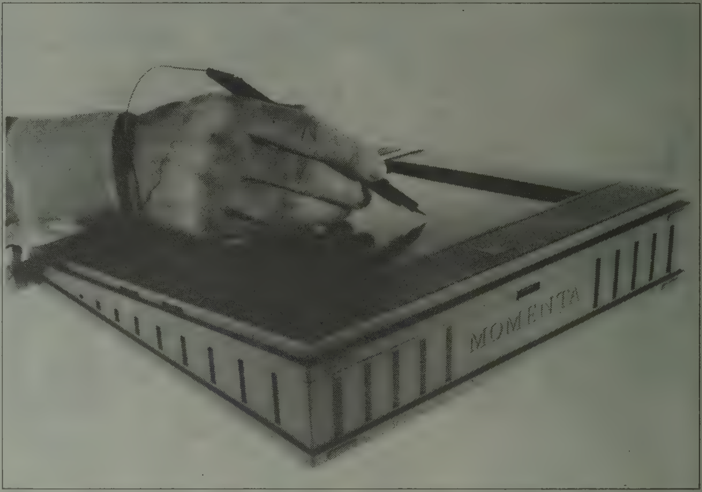
A dream of mine was to create a computer I could use myself. I had bought personal computers before—I had never learned DOS or Windows, but I did buy a Macintosh, and after that I bought some other notebook machines. I could never really use them for a very long period, because I would go to many different meetings and I could never really spend enough time to become expert on any of these machines.

I wanted a type of machine that was much easier to use, and I could take it with me anywhere, and use it in the meetings.

I didn't come from the PC industry. Previously I had co-founded a semiconductor company and before that I'd co-founded a software company. PCs were a new business for me, so I started to go around and talk to a lot of experts. When I talked to [the people who eventually became the management team], all of these people had a similar idea, and when I explained to them what my needs were and what could be interesting from my point of view, all these people became very excited and said they'd been thinking along the same lines. They wanted to come and make it happen.

We talked to some of the investors who had a good relationship with us in the past—we had made a lot of money together with the investors in my previous ventures. At the beginning, they asked us for a business plan, and we didn't have time to write one, so they gave us a million dollars with no business plan.

A lot of your investment comes from firms in Europe and Asia. Did you have trouble getting funding from US sources?



The Momenta 386 Notebook offers a real difference—a computer screen you can write on.

One of the key reasons we went global is that when you have to raise $50 million, regardless of how happy or generous your investors are, you cannot rely on your base of capital to be located in only one country.

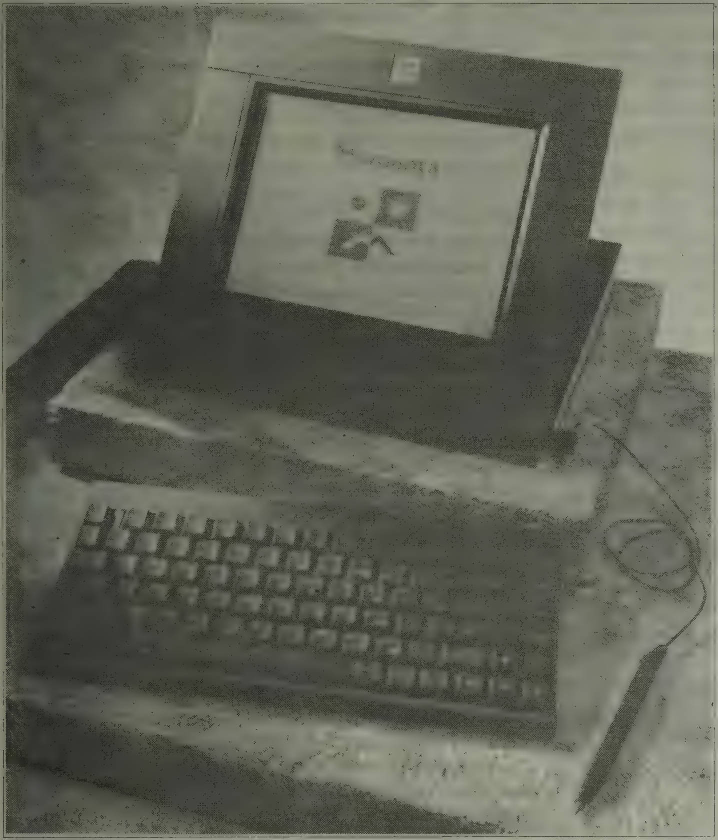
That's one issue, and the second is that when you concentrate your investors all in one country, all you get from them is their money. Whereas if you have investors from different countries, they can really help you with setting up your subsidiaries, with negotiations with local vendors, with recruiting of your key personnel in each of those countries, with introductions to the local banks—all those kinds of things.

So from day one, our plan was to have a global group of investors, and depending on the length of relationship I've had with the people in the past, they came at different stages. American investors had worked with me quite a bit in the past, and they believed in me, so they were the first ones who gave us, effectively, our first five million. In the second round, which was about seven million, we had American investors plus the new investors from Singapore and Taiwan. And then in the third round of financing, which was for about eighteen million, we had the American investors, additional Singapore investors, additional investors from Japan, some from Taiwan, some investors from Europe, and some from the Middle East, primarily Kuwait. In the round we just finished last week, another ten million, we had, again, all the previous investors, plus some more from Singapore, Indonesia, new investors from Korea, and one other new investor from the Middle East. Each time we add more investors. But through this whole process, you get to have really deep pockets behind the company.

How did you develop the relationships with all these international investors?

These things do not come easily. In the last six years I've been to Japan fifty-two times, twenty-three times to Europe, about sixteen times to Taiwan, over ten times to Singapore, six or seven times to Korea. You have to go over there, build relationships. My previous company, Cirrus Logic, was quite an international company also, and I was not only cofounder of Cirrus Logic USA, I was also cofounder of Cirrus Logic Japan, Cirrus Logic Taiwan, and Cirrus Logic Germany.

For each one of those you had to go spend time with the local people, learn their customs, learn their languages, learn the way they do business. People fundamentally are people all over the world—this is a global world. If you take care of them, if you set up partnerships where they win, and they win big, and they make money with you and they see that you are being fair and equitable with them, they always want to work with you in the future again. Even if they aren't able to give you money, they always refer you to other people who might be able to give you money.



Plug-in the keyboard, hit a button to switch to DOS and it works just like a conventional laptop.

You have to work at it very hard. For every one of the investors who believed in us and gave us money, there were five other ones did not believe in us, thought we were crazy, and would kick us out of their office. [*laughs*] So you just have to have a thick hide and keep looking, keep working it out, and don't take it personally, and just keep going back and looking for more and more.

You wanted a machine that would be somebody's only machine, run two different operating environments, and the current state of off-the-shelf chips didn't support that.

We had to do some custom chips. The key thing is not so much handwriting input; more important is pen-centric. The software we've developed is so easy to use, you do not have to pay a lot of attention to the machine. You can just pick up the pen and start writing, exactly the same way you can pick up a pen and start writing on a piece of paper. You don't need to worry about files or directories—everything you write is automatically saved for you. There is no Save command...

The idea is if you're imitating paper, once you write something on paper, it's there. Why do you need to save it? Save is one of those artificial concepts that computers created.

If you create that kind of environment, people in meetings can use the computer just like a pen on paper, without having to spend much time paying attention to the machine. If you look at our target market—office workers who are not clerical and are not scientifically oriented, salespeople, marketing people, lawyers, doctors, managers, executives, investors, brokers—all these are office workers who spend the majority of their time in meetings.

What does a salesperson do? What does a marketing person do? What does a doctor do? They all go from one meeting to another. If you cannot use your keyboard computer in a meeting, regardless of how light it is, regardless of how cheap it is, regardless of how small it is, when you bring a notebook machine into a meeting, it disrupts the meeting. So if you cannot do that, then you cannot use it in a meeting. So if you spend the majority of your time in meetings and can't take the machine to the meeting with you, then you don't use it. So we said, "Why not provide a choice?"

John Rizzo:

"We're not targeting highly specific, highly vertical applications such as electronic clipboard replacements. The model of our customer is somebody who's going to want to run ten applications during their day, not just one."

The implementation was rather difficult, because when you hire engineers, the first thing engineers want to do is throw away the things of the past and start fresh. But we are not technology zealots, so we had some very good talks with our engineers. We said, "Hey, we cannot ignore the past, regardless of how good or how bad you think it was. We have to stay compatible with it. Let's go and find a very interesting, compelling new object-oriented environment without throwing away the past." It was a very difficult task we gave our engineers—find a way to stay compatible, yet do very innovative, revolutionary things. My hat's off to our team.

Do you see your product line expanding beyond the single machine?

Oh, of course. We do not like to talk about our future plans too much, because we believe in under-promise and over-deliver. We kept everything under wraps until two weeks ago. We passed FCC three months ago, and usually it takes most people many months after they announce their product to do that.

We do have some very exciting products in the works, and if you like what you see, wait a couple more quarters, and you'll be amazed with the new things we offer, one after the other. There is a very rich product family we're developing.

We went out and got these phenomenal engineers who love what they're doing. After they've finished their first product, what do you do with them? They're already working on really neat things.

The Implementation

Beatriz Infante, Director of Software Development

What was the thinking behind your operating system decisions? The Momenta is different from the GRiDpad and the NCR machines and the other new handwriting-based machines that are coming out—they emphasize that they can run either Pen Windows or PenPoint. PenPoint is still out there a ways, there aren't applications for it yet, but you seem to have made a conscious decision to support Windows exclusively.

There are a number of factors. At the time, we felt it was very critical to iterate on a great user interface. You had to have a great user interface, and you weren't going to create it out of your head on a piece of paper, you were going to have to prototype it, test it, prototype and test it, over and over again. So that was one critical element.

The other critical element is that we felt we absolutely needed to provide a compatible operating system to our customers, and it would be too much to ask a customer to switch from a DOS-based system to some brand new kind of operating system that had nothing to do with their past.

> **Beatriz Infante:**
>
> **"We felt we absolutely needed to provide a compatible operating system to our customers, and it would be too much to ask a customer to switch from a DOS-based system to some brand new kind of operating system that had nothing to do with their past."**

So early on, we made the fundamental decision that we wanted to go the compatibility route. We looked at Windows at the time; there were some development efforts starting at Microsoft, but they were still a long ways away.

Plus, we felt that you really did need to step back and think of the user interface as being from the point of the pen rather than the point of a mouse. We started thinking about how we wanted to shape our user interface, and how we wanted to do our development, and by sheer fortune stumbled into Smalltalk.

We were quite surprised that folks such as IBM and NCR, Hewlett-Packard, had been using Smalltalk for a number of years, primarily for in-house applications. But IBM at the time was aggressively moving forward with Smalltalk.

Did you have a lot of contacts at Xerox PARC, where Smalltalk originated?

No, it actually came to us through a small recognition company we acquired; they had been using Smalltalk to prototype their recognition capabilities, and also to provide an environment in which you could demonstrate the recognition capabilities. So it kind of came in the back door.

There were a number of things we felt we needed to do with Smalltalk. We had to address the multiprogrammer development problem—Smalltalk is basically a single-user development environment, and that of course is not acceptable. We felt we needed to provide the ability to load and unload applications, *a la* an operating system. We felt we needed to provide for what's called "persistent storage," where you can keep the user information outside of the Smalltalk environment, out on disk or in memory or somewhere. A whole host of other issues, and we addressed all of those, either through partnerships with some of the vendors we've been associated with, or through our own development work.

Did you consciously reject PenPoint?

PenPoint at the time was just not an option. First of all, it was not a [DOS] compatible system, and that was of primary importance. Also, at the time, GO was a direct competitor. They were in the hardware business and were not specifically licensing their software.

They also were really focusing more on the pen-pads, a more low-cost, no-hard-disk kind of environment. And we felt that in order to have a good strategic business decision, we needed to support a range of hardware—hard disks at the high end, and diskless workstations at the bottom end. So there really wasn't a very good technology match, or philosophy match, between what GO was trying to pursue and we were trying to pursue.

Again, because of our focus on compatibility, we wanted to sell both into existing laptop/PC owners, as well as to people who don't currently own a computer. By positioning ourselves the way we have, as a pentop—a full-featured laptop, a very powerful laptop, plus you have the pen capability—then you can sell into the market of the people who are currently looking for a laptop. And they get all of those advantages, plus they get the pen.

We approached it from that perspective, and therefore from day one we integrated the concept of the keyboard as part of the product. You would be using a keyboard as well as a stylus, and that was very different from what GO was approaching—they felt you had to throw everything away and be pen-only. We didn't think that was a viable strategy, because we wanted to sell this machine into existing customer bases that already owned PCs or Macs.

The reality of life is that you're going to be selling into companies like this one, where we have Macs, we have Suns, we have PCs, most of which are networked together. We needed a computer that was compatible with all of those, was able to interconnect with them, and was also a compelling computer.

As far as I know, PenPoint will accept a keyboard, and will import files from other machines. So where your machine differs is that the keyboard is an integral part of the design, and so is DOS compatibility, which PenPoint does not have.

Right.

So what are the tradeoffs? In PenPoint you can take any document you've got and embed it in any other document you've got. You can have instant updating across documents.

We have all of that.

Could you explain how that works under Windows?

That doesn't work under Windows—in our Momenta environment, we have a document-oriented architecture. We have what you call stick-ons, or application applets, where you can embed those on

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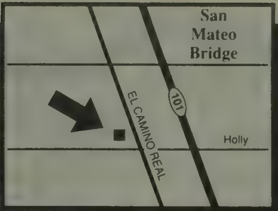

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any piece of stationery. So for example, if you have in our Presenter application, you can take free-form handwritten text, you can do the standard graphics, circles, etc. You can embed a piece of chart paper in there, you can resize the chart and edit it. It's completely live. You can place it in a document, and the document will reflow itself around the chart. With a drawing of some sort, again, the document would reflow around that. So we support all the capabilities that PenPoint supports, in terms of embedding documents anywhere in the system.

Both in your own operating system and the DOS applications?

No. We should talk about that.

The Momenta Application Development Environment, code-named MADE, is the object-oriented environment which is based on Smalltalk. That runs on top of DOS, it coexists and cooperates with DOS, so any facilities that are available at the DOS level are also transparently available within MADE. So if you're connected to a network through your standard Novell services, we can access anything on the network transparently. Because if DOS can do it, we can do it as well. Within that environment, you can embed documents. You can use the pen in a truly pen-centric fashion.

You can step aside from that—you can do that as easily as hitting a button that says "Momenta to DOS." A couple of seconds later, you're in DOS. At that point, through some software and some custom video hardware, if you have a keyboard plugged in, it looks just like a laptop. You've got a keyboard, you've got a 640 x 480 screen. If you remove the keyboard, we automatically sense that, and paint what we call a Tappit keyboard on the screen, which resides in space that's outside of video memory that's known or available to the application.

So with this keyboard, which you can tap on with a pen, any DOS application can run unmodified. In addition, we can also use the pen to position, as you would with a mouse. So, for example, you can run Lotus, you can tap on a cell, and you can enter in a number, and that would work.

What we've done as part of this bridge environment, is develop custom keyboards that run with each application. The main part of the keyboard is just a standard 101-key keyboard, but in addition, applications such as Lotus may have special commands, such as Retrieve File, which translates to a Slash-F-R if you're using a keyboard. Rather than forcing the user to tap that out with a tap keyboard, we define macros. That's something the developer can do or we can do. We'll be bundling ten different custom keyboards for the top ten major DOS apps. So in the case of Lotus, we would define things like Copy, Retrieve, Save, Quit, etc. We'll translate those as macros into whatever Lotus would understand.

Instantly you can be pen-aware for an off-the-shelf application. It will run, and in addition, if it's one of these ten applications that we have selected, we'll have extra custom keys that will make your use of that application even easier. But we run with any DOS application.

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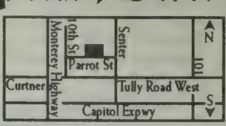

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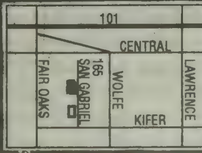

[illegible]

So those are the two environments. In addition, we will support Pen Windows as soon as it's released, and we'll provide that as part of our product offering.

So as the upgrade path appears, you see yourselves going an exclusively Microsoft route.

We anticipate that we will remain compatible.

Is there anything about your hardware or software architecture that would preclude going with other operating systems? For example, say two years down the line PenPoint takes off and becomes a significant standard.

There's nothing we know of that would preclude PenPoint running on our hardware. The only thing that might be a factor is the fact that we do have a hard disk. GO is working on this, but to my knowledge they do not support movable media *a la* disks. I'm sure they will at some point—obviously they're going to have to.

To what extent do you expect people to develop new applications for the MADE environment versus the DOS/Windows/Pen Windows environment?

We're going to do all those. We're a systems company, and we're going to succeed by giving the customer what the customer wants. If the customer wants Windows, we'll provide that. We feel we've got a tremendous pen-centric environment, and everyone we've shown this to, everyone who has used this has shown tremendous excitement. "This is the wave of the future." "We want to use this." But we're going to provide what the customer wants.

As far as developers are concerned, we've had several training classes. We've kept them very small by design, and have been very successful. We had our first developers training conference on April 15, 1991, a two-week training class. That class was attended by a number of people, but two of them were from a small startup company called PenWare, which wanted to develop a spreadsheet for our platform. In August they were demonstrating a full-featured spreadsheet that read Lotus files, was able to import and export them, was able to do all kinds of amazing things, and in addition had infinite Undo capability, Undo and Redo. All of that developed in four months, and they're going to be shipping in our box when we ship in November.

Is that because your system is easy to write for?

Yes, absolutely. We have a tremendously productive development environment. Just to give you an example, the PenPoint developers course has an eighty-odd-page program, which is a Tic-Tac-Toe program, as an example in their book. One of our developers who had attended the PenPoint developers course coded that up in a couple of hours after the second or third day of our training course. With some additional debugging and putting together of a user interface the next day by one of our developers, as an example to the developers class, the same Tic-Tac-Toe program, the same functionality, was implemented. Overnight, and it took about four or five pages of code.

We provide an applications framework, in which developers basically just need to add extra functionality to make their particular applications work. Because it's an object-oriented environment, they inherit all of the functionality of the system that normally you would have to implement yourself. Printing, faxing, all of that functionality is inherited by your application.

We provide an interface builder, which lets you graphically place components on the screen and tie them to code. It makes user interface creation very rapid. We also provide full system services in terms of power management for the machine, as well as all of the persistent object storage. Our virtual object system manages all the objects and takes care of them whether they're on disk or in memory, swaps them in and out for you automatically, so you as a developer don't have to worry about it.

We also provide a multiuser, multideveloper programming environment which is the greatest thing since sliced bread. [*laughs*] I come from an environment where I developed on workstations, and I'm used to development in a network environment with fairly powerful workstations, and this is better than anything that's available today anywhere. It allows our developers to work on what they're working on, and have very fine-grained revision control so they can go back to the previous revision if the new one isn't working. There's no time delay for compiling. In previous systems I worked on, we spent all night compiling, and that was kind of how we built software—you coded during the day, and the last person out set up the overnight compiles, and in the morning it sometimes worked...

And you'd come in to a nice bunch of error messages...

Right! And you'd sent email to all the developers—"Your bug is still there." "Your piece of code doesn't pass the regression test." Etc. We don't do that. We are incredibly productive because we don't have to sit around waiting for a compiler to do its thing.

If you're a DOS developer with existing applications, it makes sense to go the Pen Windows route. It's a lot less work. Who would be better suited to writing to your own system than to Pen Windows? And, a side question that's sort of related to that—do you have any plans to license your software environment to other hardware vendors?

In terms of the development risk, we've tried to reduce the development risk by having a very productive environment. Rather than having 50 of your people developing an application, you can have one or two of them developing an application. So it's a very low-effort investment.

But in addition, if you have C code or if you have existing programs that run in DOS—many companies nowadays are structuring their programs so that they have a user interface layer which is retargetable across various platforms, and then a core program. We are actually able to utilize C code within our system—our entire recognition system is in C, our spell-checking capability is in C, so we're able to leverage large existing DOS programs into our environment, and all you need to do is rewrite the user interface. So that further reduces the developer's risk, and if you're making the decision, it's obvious that Pen Windows is a no-brainer.

And then you're going to have additional resources which are devoted to other environments. We have found that enough people are excited about the environment, the productivity gains that they can have, and the kind of exciting applications they can develop, that they're willing to put in the investment of the extra one or two or three people for this sort of wild and crazy project. That's how we've dealt with all of our developers, and we've had really good success with that.

As far as licensing our software more broadly, that is definitely something we have discussed, and we'd rather not make a comment either way at this time.

The Market

John Rizzo, Vice President of Marketing

What has been your role with the company?

The first thing I focused on was developing a business plan for the company so we could go out and get funding for the business. The second was to work with our engineering team to define what we thought was the right product. And then more recently it's speaking with customers, getting the introduction planned, positioning, doing

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the advertising press relations, and so on, making sure the price was right and we had the sales channels in place to service the requirements of the customer. Very recently we started to staff our service and support organization, which reports to the marketing group.

Who do you see as your customer?

Our customer is anyone who spends a lot of their work day away from their desk. That doesn't mean that they're necessarily on airplanes or cars, but if they're not in their office very much during the day, they're a highly mobile person, that's the first criterion.

The second criterion is that when they're away from their desks they need to be interactive with a lot of other people to get their jobs done. And the third criterion is that they must benefit from the power of a desktop computing resource to make themselves more productive.

So when those three things intersect, that defines a very horizontal market of people like managers, consultive salespeople, consultants, bankers, lawyers, doctors, marketing people, journalists, students, professors, and so on. White-collar business professionals who want to have one machine that they carry with them all the time, to sort of manage ten things in their life.

In the short term, we're looking at carving off two major chunks. Anybody who's thinking about buying a DOS- or Windows-compatible notebook computer should evaluate this as an alternative to a notebook, because it does basically everything that a notebook computer does—runs DOS, runs Windows, comes with a keyboard—plus it does a lot of things notebook computers can't do by virtue of its revolutionary pen interface. That's one chunk.

The second chunk is those people who today may be familiar with computer techonology but haven't been adopters of it because they're not literate with keyboards, or because they haven't found a machine that's mobile enough, or they just haven't found something that meets their requirements. That's a whole new set of users.

We're not targeting highly specific, highly vertical applications such as electronic clipboard replacements. The model of our customer is somebody who's going to want to run ten applications during their day, not just one.

This is not just designed as the answer to a rack-jobber's prayer.

Exactly. We are very different from GRiD and from IBM and from NCR, who've really talked about pen computing being for those who don't know how to use computers, specifically blue-collar vertical market areas. We've architected and designed the product from the beginning to go after this horizontal market. That's why it's got a keyboard—because many people who are computer literate don't want to give up their keyboard. That's why it's got a Microsoft standard in the operating system side, to make it compatible with all the business applications that are out there. That's why it's got bundled pen-centric applications as well on the hardware, so people can do useful work very quickly, and don't have to wait a year or two for software to be developed for the machine to make it functional.

In some ways we're doing what Apple did with the Mac back in '84—a revolutionary new user interface, bundled applications. The difference between then and now is that we've put our application environment on top of an industry standard operating system, rather than attempt to create yet a new operating system.

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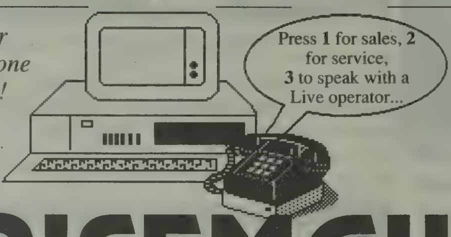
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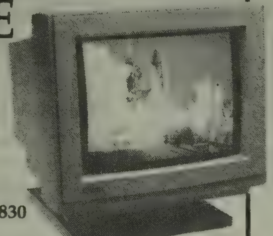
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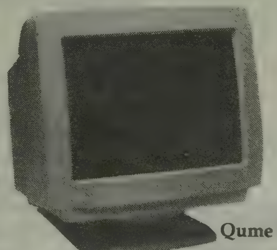
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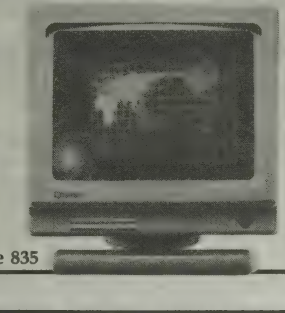
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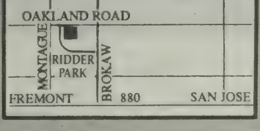

you plan to avoid going the way of the DEC Rainbow and the Seequa Chameleon?

I think the general feeling is that if you're trying to do two things at once, you're going to be equally useless at doing both. I think we have consciously made sure that the compromises we made in allowing the machine to do both things didn't compromise things in a way that had a significant downside for the customer.

For example, our ergonomic design—the screen comes up so it works well in desktop mode, and when it flips down it's more comfortable than a pen-pad computer because of its angle. The things we have eliminated from this machine, such as a floppy disk drive, which is an external peripheral, the fact that we've got backlight announced and realize that backlighting is important for the notebook buyer—we think for a first product the compromises have been appropriate.

From the pen side alone, it's a very well engineered pen machine. And the keyboard works well, it's not a cramped keyboard, it's not molded to the plastic so you're not prevented from moving it around and using it in an optimal fashion for your own working style.

Momenta's challenge is a very simple and pragmatic one. We can't wait four or five years for people to realize that pen computing is the best thing since sliced bread, because we're privately financed, we have limited resources. So our challenge is very simple: We've got to sell computers quickly, before the large entrenched suppliers—like Compaq and Dell and AST and IBM and Apple—come into the market. And the way we do that is by offering a notebook computer that is in many ways a better notebook, and a pen machine that's a complete, compelling pen machine from day one, in the same package.

The pricing is aggressive—if you compare this to, say, a Dell notebook computer that's similarly equipped, with the same amount of RAM and a faxmodem and Windows and so on, you'll discover that this is about a hundred dollars more expensive at the street price than a Dell notebook.

But what about the situation where the customer says, "Well, this is just perfect, but we're a XENIX shop"?

Because we have essentially an Intel-compatible processor, you can run XENIX on this machine if you wanted to. The other question becomes, "How do you run XENIX with a pen?" and then we'd have to do some relatively simple work to build a driver for that. And in fact, Smalltalk, which is the root environment, runs today on DOS, Windows, OS/2, UNIX.

So conceivably, anything that runs on an Intel processor will run on this, it's just that it's not there yet.

Right. And also conceivably we could also port our pen-centric application set to any operating system. We're porting it now to Windows; we could port it to UNIX if we wanted to.

What we try to do is to develop a complete product within a two-year period, that had enough horizontal applications to make it appeal to a broad public. That's our challenge. We must execute on this before everyone else figures out there's a big opportunity there.

Recently, some market forecasters have started to change their opinion about this market. Two years ago, the people you talked to would say that the big market is in vertical market pen-pad computers, that is, pen-only computers. Most recently, analyst Bill Lempesis

Continued on page 192

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Years ago, during a touch football game in Winterland between us Dead guys and his Blue Coats, Bill decided he was going to halfback the ball through my spot in the line. I suddenly found myself looking across (and way up) at BGP's largest employee, whose mission was to put the quietus on me. Right before the play was commenced, Bill stopped everything, walked up to my opponent, and whispered in his ear. I'm sure he didn't mean me to overhear him saying, "Be careful not to hurt him. I just want him out of the way for this play." Then he went back into position and started screaming in my direction in the most intimidating way possible.

> **I could never tell how much Bill was delegating, since I would always see him at concerts fiddling with the most peripheral details. It occurred to me that without him, those details would remain unfiddled with.**

When I heard that he had plunged out in an appropriate fireball of big electricity and jetfuel—I imagined the Ride of the Valkyries thundering from an 8-channel Dolby soundtrack—I had a lot of reactions. Mostly I knew I would miss him personally. Unlike some, I had always been glad to see him and he me.

I also worried that his empire, whose works are so important to both San Francisco and the Grateful Dead, would collapse like a Byzantine dome with the keystone plucked out. I could never tell how much Bill was delegating, since I would always see him at concerts fiddling with the most peripheral details. It occurred to me that without him, those details would remain unfiddled with.

The extraordinary gathering at Golden Gate Park on November 3rd put that concern to rest. With three hundred thousand people in the audience and some of the biggest acts in rock onstage, this was a Woodstock-class event. Ordinarily, such a concert would have required months of planning, but the whole thing was assembled by an organization which had, following the Dead's Oakland run, just three days to put it all together. And it ran like a brass calliope! It was a thing of such beauty that it made me pray for the dubious possibility of afterlife, just so Bill could see it.

Another of his great accomplishments was also in evidence: Three hundred thousand people gathered in conditions of such density that cold fusion was probably happening near the stage, and yet none of the horror which usually attends such concentrated humanity arose. I was all over that crowd and all I saw were attentive, joyful faces. People having just the kind of good time Bill loved to assure.

This was because, over years of careful effort, Bill had trained them to be the best audience in the world. He had managed that audience like a class, hiring decent folks rather than goons for his security, giving plenty of personal instruction to the miscreant, rewarding the well-behaved with passes and other favors, and making personally certain that he gave good value.

In the end it worked. Bill Graham, this immense guy who seemed so nearly barbaric, had brought civilization to rock and roll. Let's hope it remains there to honor his memory. ■

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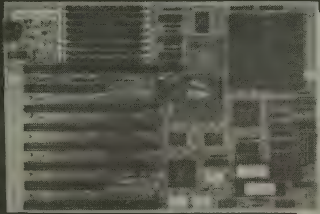

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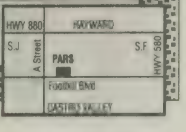

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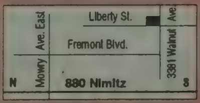

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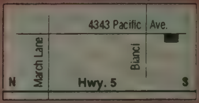

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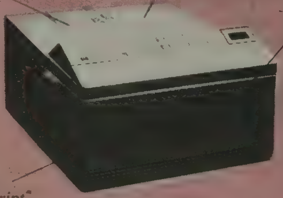

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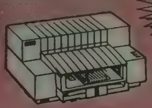

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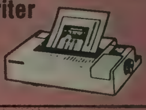

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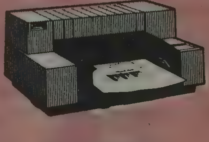

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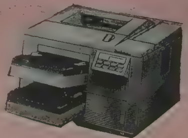

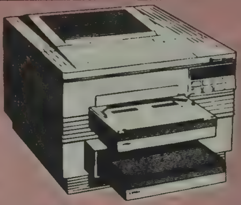

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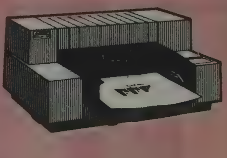

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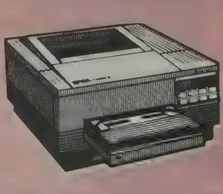

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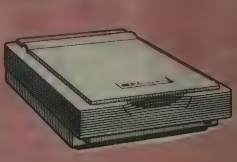

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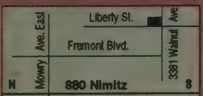

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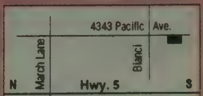

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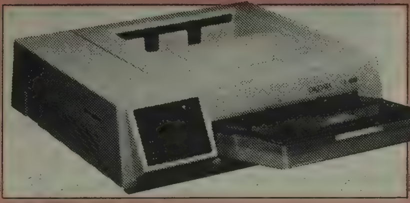

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The Laserless Printhead: Warranteed For 5 Years.

The OL400 also comes with the longest warranty in the industry: 5 years on the printhead, plus 1 year parts and labor on the entire printer. To deliver a warranty that strong, our engineers had to re-invent the laser printer.

To replace the conventional page-printer technology of laser beams, lenses and rotating mirrors, they designed a proprietary, solid-state LED printhead with no moving parts.

Its All In Our Head.

Besides being inherently reliable, the simpler design of the Okidata printhead also means a straight-line paper path that's less likely to jam—even when feeding envelopes, heavy stock, or labels. And, since we build it ourselves, the cost stays low.

The Okidata OK-A Badge Of Honor

The performance and features of the OL400 were good enough to earn it a PC Magazine Editors' Choice Award. But it also had to earn something else — the Okidata OK.

What's the Okidata OK? Simply our promise that every printer we make will deliver not merely acceptable performance, but out-standing performance — not just good value, but exceptional value.

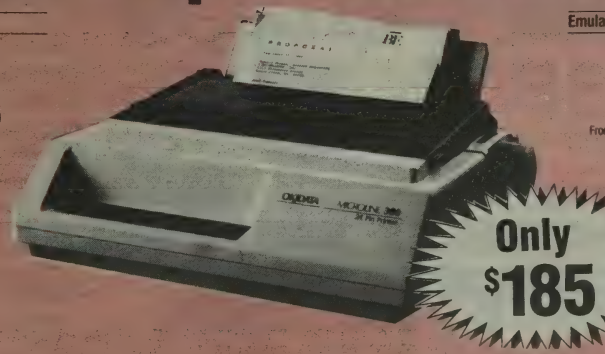
OKI OK!
OKIDATA® OK!

We don't just design it to work. We design it to work wonders.

OKIDATA® 24 pin MICROLINE® 380

Technology, Speed, and Print Characteristics

Print Method:	24-pin (.20 mm diameter), Impact Dot Matrix	
Print Direction:	Bidirectional, short-line seeking	
Graphics Resolution:	60 x 72 dpi minimum 180 x 360 dpi maximum	
Print Speed and Character Matrix:	**Speed**	**Horizontal x Vertical**
Letter Quality	60 CPS	30 x 18 @ 12 cpi
Utility	180 CPS	9 x 17 @ 12 cpi
Characters Per Line:	**CPI**	**Max. Char./Line**
	10	80
	12	96
	15	120
	17.1	137
	20	160
	PS	—
Vertical Line Spacing:	**Fixed**	**Variable**
	6 lpi	n/60"
	8 lpi	n/180"
Feed Rate:	2.2 ips	
Character Sets:	Standard ASCII Epson Character Set IBM Set I and II 14 Foreign Language Sets Zero/Slashed Zero	



Only $185

Emulation, Interface, Memory and Front Panel

Emulation:	Epson® LQ
Interface:	Parallel Standard Optional 19.2 kb Super-Speed Serial RS232-C(Ready/Busy, X-ON/X-OFF)
Memory:	
Print Buffer	8K
DLL	14.5K Maximum
Front Panel Switches:	Select Line Feed/Form Feed Top of Form/Paper Park Font Selection Pitch Selection
Menu Mode:	Print — Prints Entire Menu Group — Selects Group Function Item — Selects Item Set — Selects Item Value Exit — Exit Menu Mode, Enter Select State

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HP III/Postscript	1469/1899
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OKIDATA®

ML320	$290
ML321	407
ML380	209
ML390 PLUS	407
ML391 PLUS	553
OL400	599
OL800	899
OL830	1249

EPSON®

LX810	$152
LQ510	237
LQ570	254
LQ860	542
LQ870	428
LQ1010	346
LQ1170	587
FX850	286
LX1050	400
DFX5000/8000	CALL

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386-33MHz
64K Cache &1MB RAM

LandMark : 50.3 *SI* : 40.1

MADE IN USA

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•12 scalable fonts • 200 Sheet paper tray • 8ppm, 300 dpi • **PCL-5 language** • HP Series III compatible •1-year parts & labor warranty

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II*P Plus* 4ppm	849
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SPECIAL BUY ON OKIDATA LASERS

5 YEAR PRINTHEAD WARRANTY

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$609

•17 fonts/4 type faces
•200 Sheet paper tray
•4ppm, 300 dpi
•HP Series II compatible

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MT904 LASER

Super Value!

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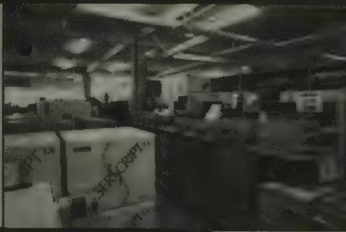

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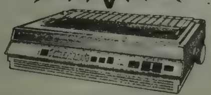

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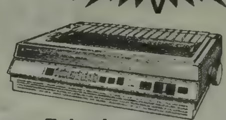

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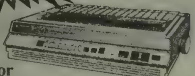

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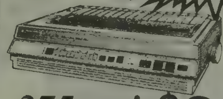

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- High speed printing
- 375 characters per second
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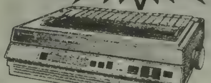

- 192cps, 63cps LQ
- 5 built-in LQ fonts
- 2 year warranty

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KX-P1524

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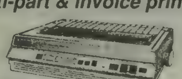

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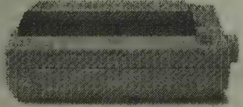

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- 190cps, 60cps LQ
- 360x360 dpi resolution • 24-pin
- 11 resident fonts • 2 year warranty

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300cps!

EX-800

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- 300cps • 9-pin printer
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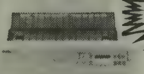

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High-Speed Color!

$599 *400cps!*

- 400 characters per second
- 360x360 dpi resolution • 24-pin printer
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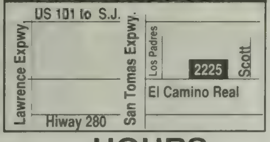

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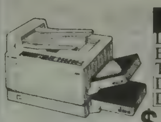

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Envelope Tray	.69
Toner	39
Drum Unit......	149
Developer	99

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- 2MB RAM exp to 4MB
- 500 sheet paper capacity
- 26 internal fonts • 11PPM

KX-P4450i $1099

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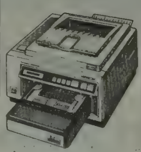
Developer	89



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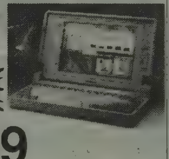

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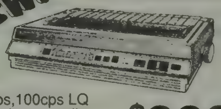

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- 24-pin letter quality
- 11 fonts, 26K buffer
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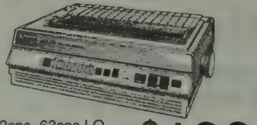

- 192cps, 63cps LQ
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KX-P1180 ....$144

KX-P1124*i*

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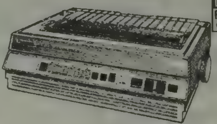

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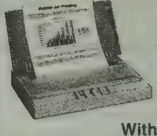

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Removable HDD!

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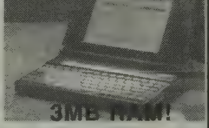

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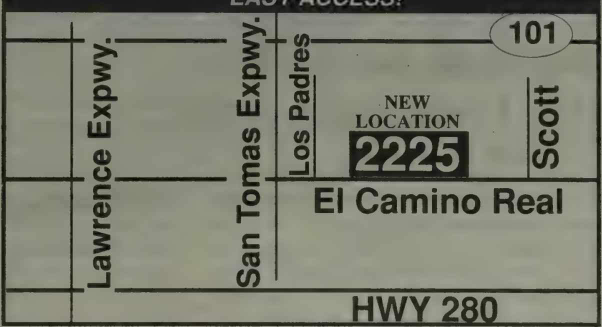

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•4 Paper Paths!
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FAST 413cps!
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Getting Off Your Island

Reaching And Navigating The Treacherous World Of Online Communication

BY PAUL HOFFMAN

Modem-based communications are critically important to the way business is done in the 1990s. They're also a great social and conversational tool.

Which makes it particularly unfortunate that in 1991, people are stuck using technology that was never meant to last through the 1980s. Telecommunicating with a computer remains a temperamental, clumsy, and often downright user-hostile process, and until the US gets wired for advanced data interchange (such as ISDN) many years from now, about the only way to communicate between two distant computers is with old-style modems.

IT'S A JUNGLE OUT THERE

In order for you to call another computer with a modem, you need to know in advance the "modem settings" that the other computer is using. Those settings include such "obvious" things as baud rate, number of data bits, number of stop bits, parity, handshaking, and on and on. If you use the wrong settings, you will not be able to communicate. Worse yet, you get no error indication that you are using the wrong settings other than the fact that you cannot communicate. This severe lack of friendliness is a leftover from the 1970s that still drags us down today.

To use a modem at all, you need a communications program, commonly referred to as a modem program. These programs let you interact with other computers that have modems. They let you make the settings needed to communicate (as long as you know them in advance), type messages, and often send files. Note, however, that sending files is often difficult unless both computers are of the same type and running similar software.

Of course, modems and communications software are not only for advanced users. Millions of people use them every day. However, they often use them only to communicate with a single outside computer, so they can get by with a single group of settings. Few modem users are comfortable enough with the tools to try calling unfamiliar computers or services without a fair amount of trepidation. Even with the dozens of interesting services available for home and business use, few people try more than one or two.

SPEED

After the difficulty of setting modems, the biggest deterrent to online exploration is the speed of transmission. Most people use either 1200 or 2400 baud modems. This translates roughly to a maximum of 100 or 200 characters a second—pretty fast by typing standards, but abysmally slow when you're trying to send or receive files, even small ones.

For comparison, assume that you see a graphics file on a service that sounds interesting. It is 50K, a reasonable size for a graphics file. With a 1200 baud modem, that would take roughly eight minutes; a 2400 baud modem would cut that to four minutes. Even that is a long time to wait just to see whether the picture is any good. On some services, it can also be expensive. With today's emphasis on instant gratification, there's a great deal we can do in much less than four minutes, so most people don't bother browsing on services.

Faster modems give you more information in less time. The current standard for "modern" communications is 9600 baud, or four times as fast as a 2400 baud modem. Many modems have additional data compression built into them, but that compression is often of no value since the modem on the other computer must use the same kind of compression. Even at 9600 baud, a 50K file takes about a minute. Imagine what can happen on TV in a minute.

THE DAILY TELECOMMUTE

Although many people think chiefly of commercial services like CompuServe when they think of computer-based telecommunications, modems are probably more useful as work tools than for leisure-time activities. Dialing into work may seem a bit repressive to people who can't wait until they get out of work, but if it allows you to stay away from the office, it may be a blessing in disguise.

The coming revolution in "telecommuting," or working from home, is based totally on modems. The idea is that, if your company has a well-organized computer with which you can communicate easily, you can work from anywhere there's a telephone. Your home computer holds most of the information you need, and you can get access to the others by dialing into your company's computer.

At present, though, many impediments keep the vast majority of people from telecommuting. First, it is almost always wrong to assume that your company's central computers are well organized and

Continued on page 157

> **The coming revolution in "telecommuting," or working from home, is based totally on modems. The idea is that, if your company has a well-organized computer with which you can communicate easily, you can work from anywhere there's a telephone.**

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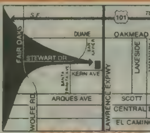

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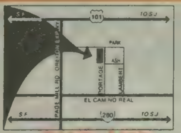

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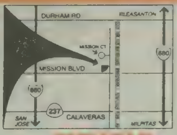

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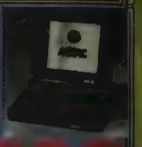

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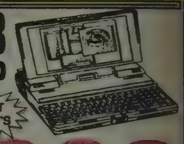

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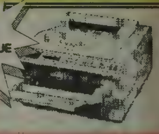

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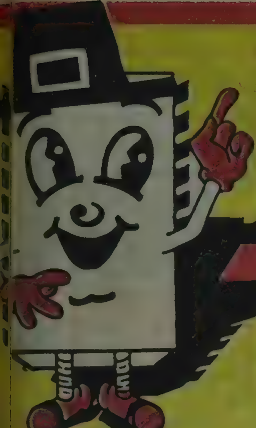

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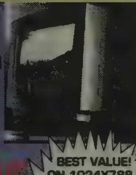

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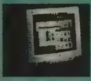

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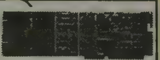

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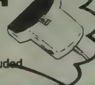

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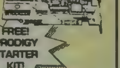

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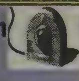

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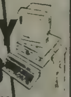

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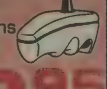

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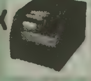

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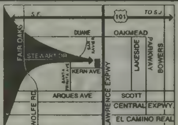
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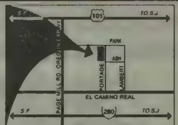
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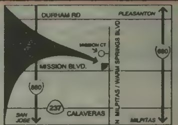
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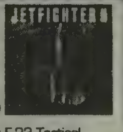

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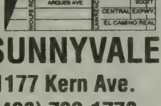

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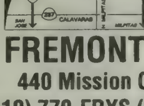

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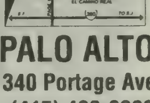

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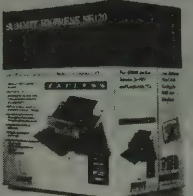

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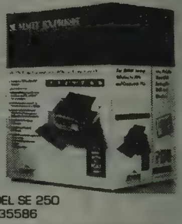

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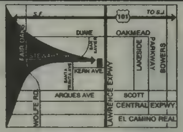
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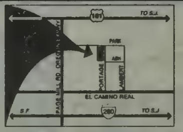
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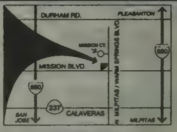
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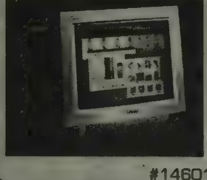

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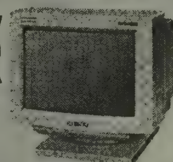

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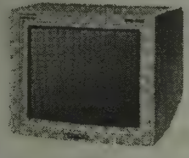

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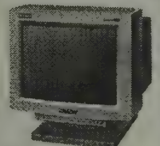

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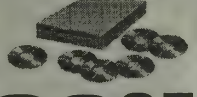

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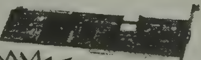

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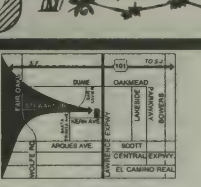

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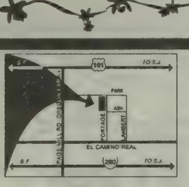

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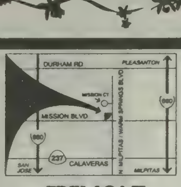

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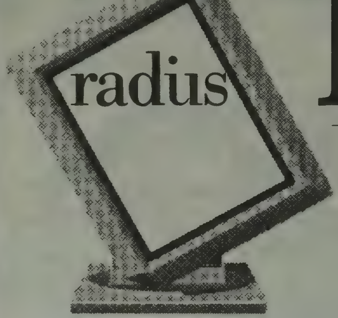

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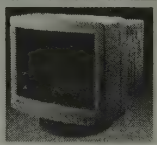

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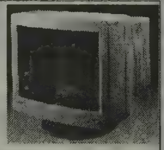

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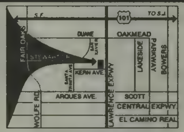
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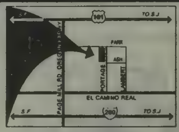
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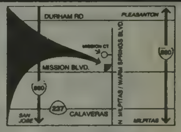
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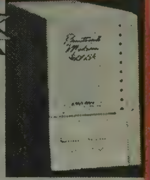

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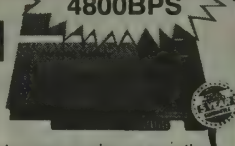
UP TO 4800BPS



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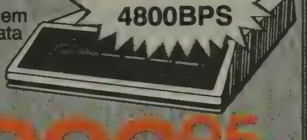

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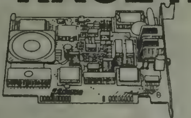

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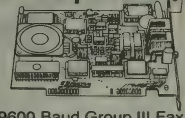

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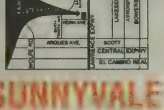

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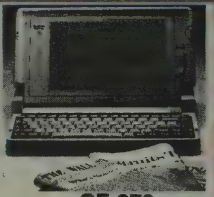

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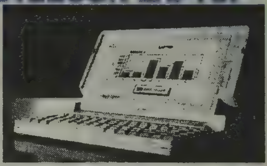

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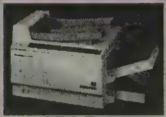

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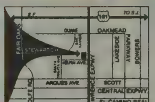

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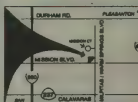

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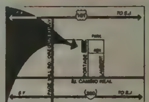

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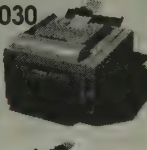

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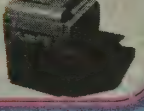

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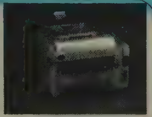

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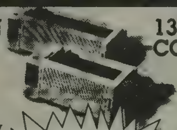

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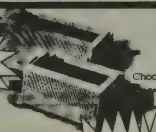

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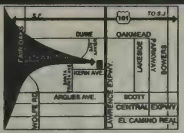

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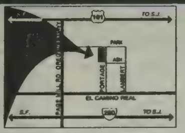

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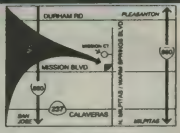

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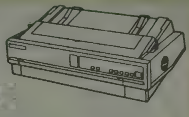

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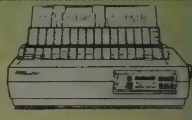

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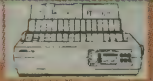

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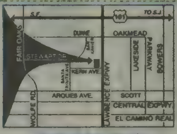

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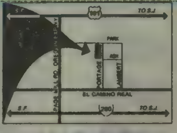

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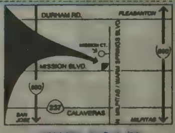

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Intel 33MHz microprocessor with on-chip 8K cache and floating point unit • Weitek 4167 coprocessor socket • 8 32-bit EISA-compatible slots • 6 slots available for bus masters • 32-bit expandable from 4MB to 64MB on system board • 8K bytes internal cache 64K, 128K or 256K second level direct mapped cache • Norton SI 4.0
Landmark v1.14 (MHz)
Power Meter v1.3 (MIPS)
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33MHz 486 ISA BABY-AT BOARD

Intel 33 MHz 80486 microprocessor with on-chip 8K byte cach and floating point unit Second levels cache option • Weitek 4167 co-processor support • 7 16-Bit AT compatible slots •16-Bit/32-Bit slots • 32-Bit Expandable memory from 1MB to 32MB on system board • Up to 64MB are supported using the m180 memory card • 8K internal cache, 64K, 128K or 256K second level direct mapped cache • BIOS Phoenix

Norton SI 4.0	51.3
Landmark v1.14	150.2MHz
Power Meter v1.3MIPS	14.6
KWhetstones	3010.0
C and T MIPS	6.4

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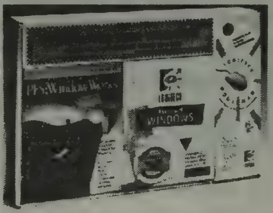

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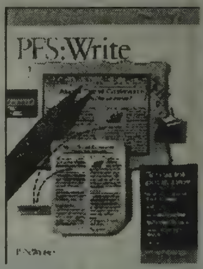

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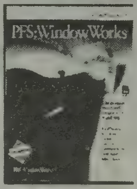

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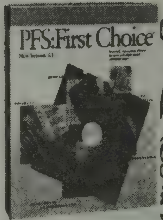

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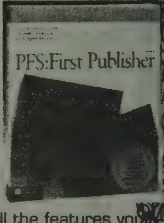

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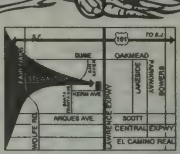

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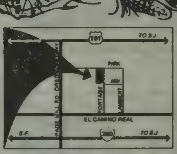

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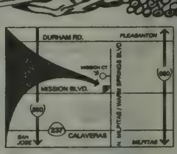

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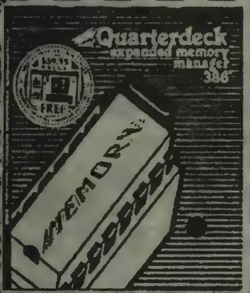
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expanded memory manager
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EXPANDED MEMORY MANAGER - 386 VER 6.0

"Break the 640K Barrier in DOS or Windows!"

QEMM-386 is a powerful, high performance memory manager and software control program for 386 PC's and PS/2's. It enhances the utilization of your 386 PC's memory by providing expanded, extended and high memory management. It's compatible with EMS 3.2, EMS 4 and EEMS

IBM
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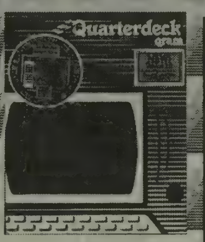
QRAM Version 2.0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QRAM is a memory enhancement tool for 8088, 8086 and 80286 PC's. It enhances the utilization of your PC's memory by managing your high memory, extended memory and EGA/VGA video memory.

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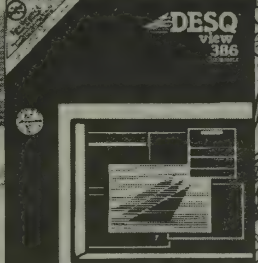
DESQ view 386 Version 2.4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view
386

It is a multi-tasking, multi-windowing control program for 386 based machines. DESQ view 386 lets you tap into two of the 386's most powerful features: its virtual 8086 and 32-bit protected models. It contains DESQview 2.4 and Qemm 386

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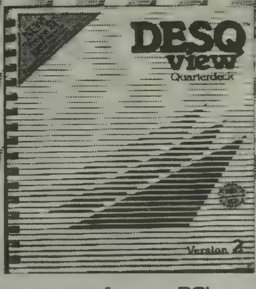
DESQ view Version 2.4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view
Quarterdeck
Version 2

DESQview is a multi-tasking, multi-windowing environment. It does windows and gives your PC the power of many PC's DESQview lets your favorite programs pop up when you need them. It transfers data and dials your phone.

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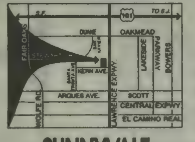
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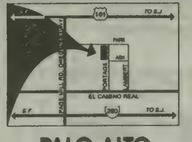
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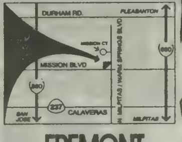
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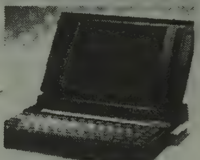

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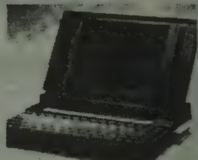

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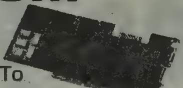

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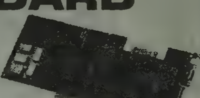

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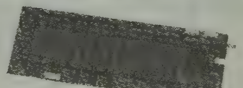

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Memory up to 3MB
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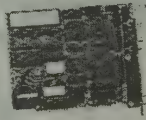

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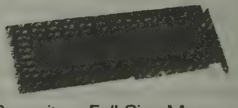

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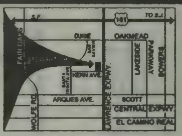
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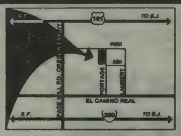
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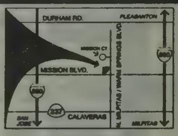
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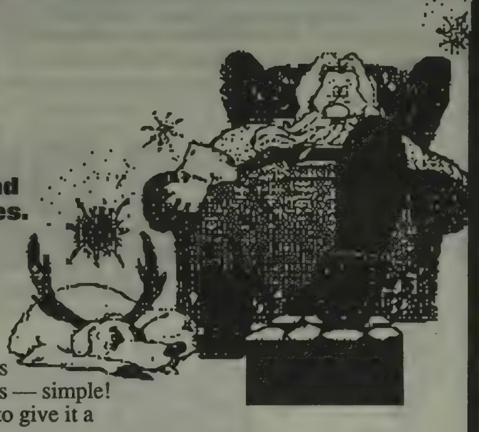
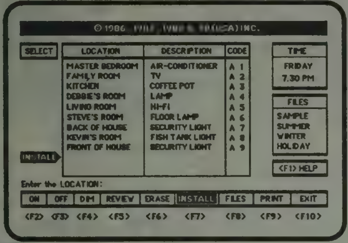
Tired of running all those wires?



The X-10 Computer Interface can control all your indoor and outdoor seasonal lights without you having to run any wires.

You plug each light to be controlled into an X-10 Modules and set it to any one of the 256 available codes. You set up the CP290 Computer Interface from your IBM or Macintosh computer to turn on all your lights at the times you want. You don't have to leave your computer turned on. You can even set-up the CP290 using your computer at work, and then take it home, its battery back-up will protect your schedule until you get home and plug it into any AC outlet. The CP290 send signals over your existing house wiring to control the lights plugged into the X-10 Modules — simple! After the Holidays, the CP290 can be set to control other lights around your home to give it a lived-in look — the best crime deterrent you can have!



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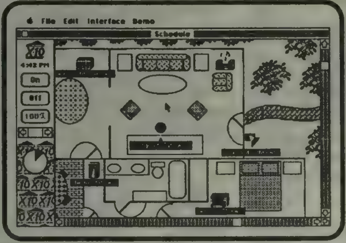
LOCATION	DESCRIPTION	CODE
MASTER BEDROOM	AIR-CONDITIONER	A 1
FAMILY ROOM	TV	A 2
KITCHEN	COFFEE POT	A 3
DEBBIE'S ROOM	LAMP	A 4
LIVING ROOM	HI-FI	A 5
STEVE'S ROOM	FLOOR LAMP	A 6
BACK OF HOUSE	SECURITY LIGHT	A 7
KEVIN'S ROOM	FISH TANK LIGHT	A 8
FRONT OF HOUSE	SECURITY LIGHT	A 9

TIME: FRIDAY 7.30 PM

FILES: SAMPLE, SUMMER, WINTER, HOLIDAY

Enter the LOCATION:

SELECT
INSTALL
<F1> HELP
ON <F2>
OFF <F3>
DIM <F4>
REVIEW <F5>
ERASE <F6>
INSTALL <F7>
FILES <F8>
PRINT <F9>
EXIT <F10>



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Demo
Schedule
X10
On
Off
100%

Easy-to-use software for IBM or Mac makes set-up a snap!

$49.95 #151860 IBM
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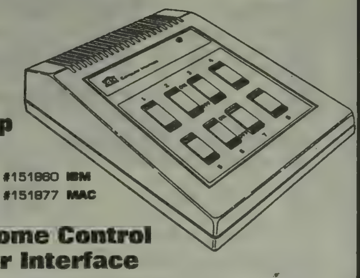


CP290 Home Control Computer Interface

WIRELESS SUPERVISED

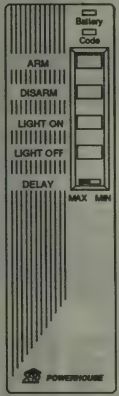
HOME SECURITY SYSTEM Model SS5400

$229.95 #1591501

Installs in minutes – No Tools – No Wiring

- Professional features and reliability
- Supervised (self-checking) sensors
- Can protect up to 16 doors/windows (with extra sensors)
- Loud alarm plus flashing lights
- Remote light control
- Wireless passive infrared motion detector (optional)
- Wireless 110 dB remote siren (optional)

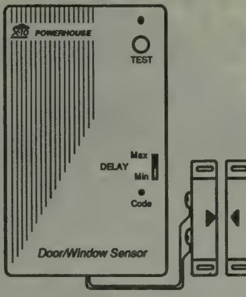
HT544
Included



Battery
Code
ARM
DISARM
LIGHT ON
LIGHT OFF
DELAY
MAX
MIN
POWERHOUSE

The system is armed and disarmed by the press of a single button — simple! You can also control lights remotely.

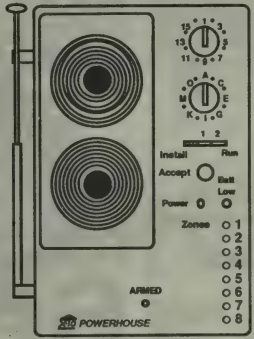
DW534
Included



X10 POWERHOUSE
TEST
DELAY
Max
Min
Code
Door/Window Sensor

Sensors send wireless signals to the Base Receiver when a door or window is opened. You can protect up to 16 door/windows by adding more sensors. Sensors are supervised for professional reliability - they report in to the Base Receiver every 90 minutes.

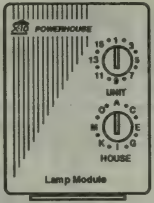
BR521
Included



1 2
Install
Run
Accept
Batt Low
Power
Zones
1
2
3
4
5
6
7
8
ARMED
X10 POWERHOUSE

Base Receiver makes a loud noise when alarm is tripped and sends signals over existing house wiring to flash lights connected to X-10 modules.

LM465
Included



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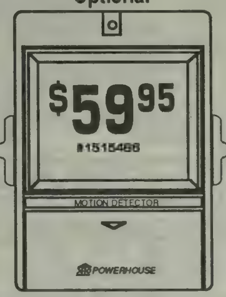
UNIT
HOUSE
Lamp Module

A lamp plugged into the Lamp Module will flash on and off when the alarm trips. You can also turn the lamp on and off by remote control.

SP544
Optional



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#1515486

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Supervised Wireless Motion Detectors send signals to trip the Base Receiver's alarm when someone walks within range.

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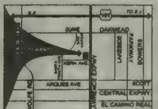

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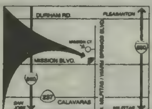

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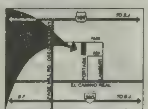

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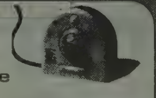

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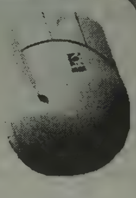

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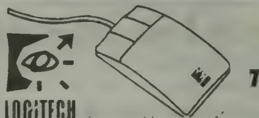

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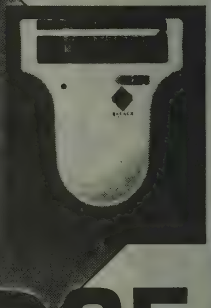

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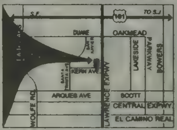
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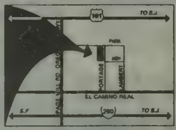
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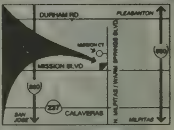
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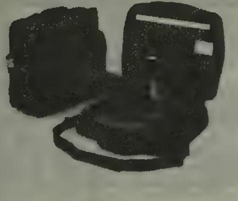

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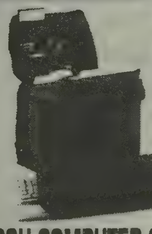

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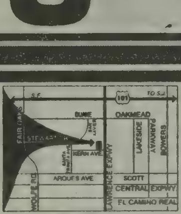

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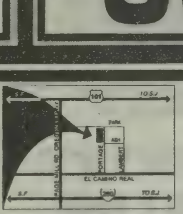

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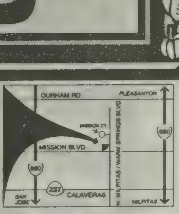

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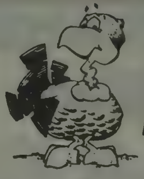

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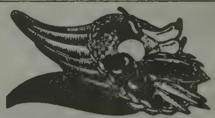

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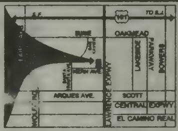
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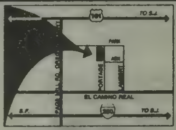
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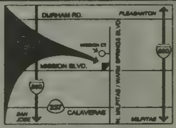
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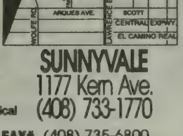

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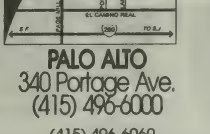

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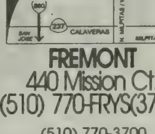

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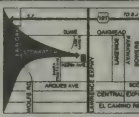

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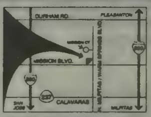

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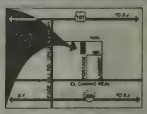

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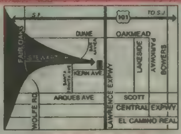
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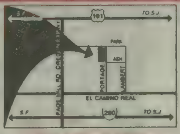
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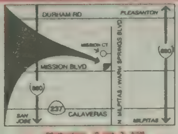
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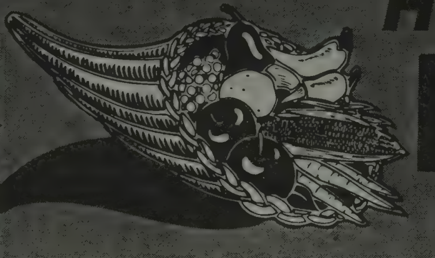

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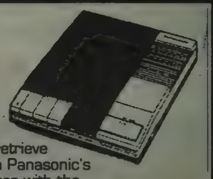

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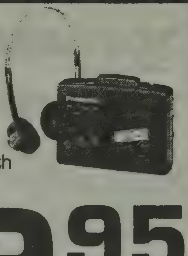

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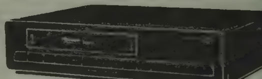

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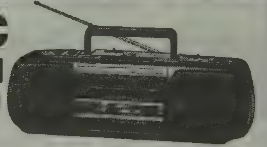

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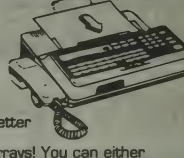

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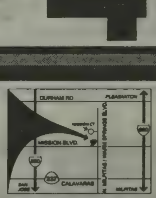

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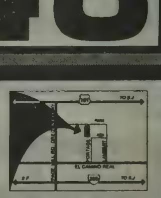

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Continued from page 130

capable of handling dial-ups from many people. These computers are usually run by people who live and die by control, and letting people call in from outside vastly reduces their control. Second, it may be very expensive to have a constant telephone link between your home and office. The method phone companies use to assess charges is fairly random, so that dialing from only a few miles away can cost upwards of $10 an hour, a prohibitive amount for many companies.

Not all these obstacles are insurmountable. With a bit of better planning, you don't need a constant phone link. You can get removable hard disks for your PC at the office and at home and shuttle your hard disk back and forth. Then, the only time you need to dial into work is for electronic mail. That can usually be dealt with in fifteen minutes, maybe twice a day. If you need particular files, you can always get them, but you'll find that you can usually plan for what you need and put it on your hard disk when you go home. Depending on how independent you are, this arrangement can be quite efficient.

ONLINE SERVICES—ANOTHER WORLD

If you have never used CompuServe or a similar network, you may need to make a major shift in your thinking about communications. Common human communication takes place mostly with visual images and sound; depending on your line of work, your most common form of business communication is either the letter or the phone call. To understand computer-based networks, it's crucial to understand how they differ from the more traditional forms of communication.

In a telephone conversation, you have direct (if only aural) contact with another person or a group, and that contact happens in "real time." Real time means that it happens at the same time for everyone. When you read a piece of business correspondence or a report, you have no direct contact with the author, and it does not happen in real time. When you write a memo, you have no way of knowing who will or will not read it; someone may pass it around in a fashion you don't want, or the person to whom you sent it may—without your realizing it—never see the memo for unforeseen reasons. Because written communications don't happen in real time, the recipient can read it quickly or slowly, day or night, and without any concern for what the author is doing at the moment.

The basic paradigm for most services and "electronic bulletin boards" is that there are conferences, and each conference has named topics. Within a topic, there is a running set of messages from people like you. A conference might be on PC software, another on PC hardware or Macintosh software. Within the PC software conference, there may be topics on spreadsheets, databases, MS-DOS, utilities, and so on. Messages usually appear sequentially so that a topic looks like the transcript of cooperative conversation.

These two issues become more important on computer networks since they are by their nature very open environments, somewhat like a large (or gigantic) cocktail party. You have no idea who is reading the messages in a topic because anyone with an account on the system can read them unobserved. The real-time problem also comes up, because you have no idea when someone has read (or will read) a message. For example, if you leave a question about a spreadsheet problem you're having, you don't know when other people have read it unless they respond.

As a basic rule, the more people use a system, the more conferences and topics are available. If you have general interests, you may find hundreds of people talking about something you want to talk about. If you have a more narrow interest (such as veterinary medicine or accounting for bookstores), there may be a conference or topic, but not much discussion. It pays to look around for a more specialized system if you have specialized interests.

The most important difference between an online service and a large cocktail party is that its participants can be geographically distant from each other—and also essentially unknown to each other except for what they choose to disclose online. Since everyone communicates by modem, and modems can be used from anywhere there's a telephone, the people who communicate are often quite far apart. If you see a message on a network from Paul Hoffman about PC software, all you can guess is that I'm male. You don't know my age, my background, my location, my politics, or my hobbies. This often makes networks seem impersonal even when people are freely helping each other.

A good question on a network will get a few answers, maybe disagreeing on major points; in the company email, you will probably only get one answer. As a result, many employees have begun to rely more on the networks than on people in their own companies.

Although anyone can dial into a bulletin board from anywhere in the country, most of them have many more local than national callers. This is directly related to the cost of telephone calls—a local call is cheaper than a long distance call. Thus, many bulletin boards get a local flavor to them, even when talking about national subjects. For example, when someone asks about buying a good PC clone, the answer might be the name of a local clone store, even though the person asking is in another city and that store doesn't do mail order.

BROADENING YOUR RANGE OF CONTACTS—BUSINESS AND PLEASURE

Few companies have discussion bulletin boards set up; usually, the most you get is electronic mail. The difference between posting a message on a bulletin board or commercial service and asking an individual in your company for help through electronic mail is gigantic, as evidenced by the results. A good question on a network will get a few answers, maybe disagreeing on major points; in the company email, you will probably only get one answer. As a result, it's no wonder many employees have begun to rely more on the networks than on people in their companies.

This, in turn, is precisely why some companies fear the spread of telecommuting—it gives employees much more freedom than they've traditionally been given. Information is not controlled as well, thoughts are passed around more easily, and work becomes unregulated. In the next five years, as more homes get wired for high-speed data transfer such as ISDN, telecommuting will look more attractive to workers and put more of a strain on corporations trying to herd in their employees.

And the phone lines will be buzzing. ■

The Online Classroom

Promise Vs. Reality

BY ADAM GAFFIN

Linda Delzeit remembers the boy from Afghanistan.

One of several foreign students in her daughter's elementary school in Buena Park, he showed little interest in school or learning.

But then Delzeit, a parent volunteer, used a computer network to link her students with students elsewhere in the world to simulate a space mission—they had to show how they would cooperate to ensure a successful mission.

"As we were writing our first thank you letters, he surprised us all with a keen desire to communicate his thanks for the fun that he had that day," Delzeit says. "He asked to spell such words as 'appreciation' and 'telecommunications' despite the fact he could barely speak English. From that point on, he has progressed rapidly in all areas of his schoolwork. We feel this is because he decided school was interesting and he wanted to be able to communicate to others via this new technology."

More and more teachers are using computer networks to expand their students' horizons. But the fledgling technology poses as many problems as solutions.

Stories like this show the promise of bringing computer networks into secondary and elementary schools. A rapidly increasing number of online projects connects students around the world, where they exchange letters in each other's languages, conduct joint science and environmental projects, and consult with experts from universities and corporations.

In California, three thousand educators now regularly use the California Technology Project's Technology Resources in Education network, according to Director Craig Blurton. A joint venture of the California State University system and the state Department of Education, the network gives them and their students access to online conferences, projects and databases, library catalogs, NASA information, CNN program guides, and worldwide electronic mail.

And educators have apparently waged a successful battle to give elementary and secondary schools access to the proposed high-speed National Research and Education Network.

THE AGONY AND THE ECSTASY

But for many teachers and students, educational telecommunication remains a promise unfulfilled. Many teachers are unable to find a modem or a phone line that can work with one—many schools use switchboard systems incompatible with the devices. Other teachers find themselves and their classes limited because their school's computers are all in one room—and walking their classes down halls or stairways would take away valuable classroom time. And relatively few schools will give teachers time off to learn their way through what can be a bewildering array of networks and protocols.

David Sawtell knows the excitement and the frustration of hooking up a school computer to a network. A secondary-level math teacher in Colorado Springs, CO, Sawtell signed up several students last year for an online class in chaos theory, led by an MIT fusion expert.

Every week, Professor George Johnston uploaded a lesson plan to a bulletin board system in Colorado, which then transmitted it, via the Fidonet hobbyist computer network, to several other systems in Colorado, Wyoming, and Montana.

Johnston, who got the idea for the project after a neighbor who works for Digital Equipment Corp. showed him the power of DEC's own worldwide computer network, teamed up with telecommunications guru Dave Hughes of Colorado Springs to create the Chaos network.

It was a chance for students in relatively remote or small school systems to study something they would probably never see in their local curriculum. For Johnston, it was a chance to expand his department's commitment to encouraging science education among high school students.

Students were required to complete Johnston's assignments and participate at least once a week in the online conference, either by raising a question or making comments.

"The content was certainly very interesting and made new frontiers as far as secondary education was involved," Sawtell says. He says the course taught his students to think about math in new ways—although they were used to solving equations, they had never had to formulate real descriptions of their work.

But none of Sawtell's students finished the course.

Sawtell says a variety of factors conspired against the students.

It was an extracurricular activity, rather than a class project. "The numbers dwindled after a while when it became clear [the work] was more time-consuming than they anticipated," he says.

The only phone line Sawtell could use to connect to Hughes' system was in the school library—and it was shared by other departments who often needed it for their own work. He says he usually wound up waiting until 3:30 or 4 pm to connect, "to be relatively sure no one would come on the line and turn it off."

ASCII does not lend itself well to math classes, Sawtell says. "Kids watch things about fractals, and, boy, they're pretty flashy," he says. "We couldn't telecommunicate pictures."

But the biggest problem, ironically, was communication, Sawtell says.

Successful teaching often involves immediate feedback. Students would get all excited when they worked out a particular problem, but because of the way the online class was structured, it could take a week or more for them to get any feedback. By then, their enthusiasm had diminished considerably, he says.

A couple of times, Sawtell says, he encouraged his students to address a point made by a student at one of the other schools in the project, but they never got any response.

"I think that's why our group decided to just stop meeting eventually," he said. "They weren't feeling they were getting enough of a return on their investment."

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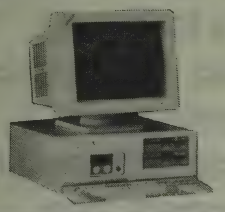

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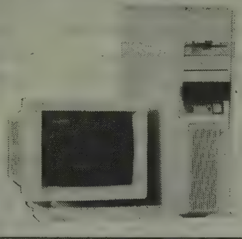

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Still, Sawtell says he remains enthusiastic about the potential of online teaching and says he would consider it again if some of the bugs could be worked out. Hughes recently spent a weekend with Johnston developing a cheap way for participants to share graphics through a graphics protocol that can be used on a variety of computers, from Apple IIs to IBMs. Johnston's wife, Pat, a classics professor at Brandeis University, hopes to use the software to teach Greek and Latin online.

Other teachers point out that a lot of vital resources aren't there yet. "I was given one phone line and modem, two hours a day, to introduce and train over two hundred kids in telecommunications," Delzeit says. "It was an impossible task, but the kids that got trained now have job skills and an increased self-confidence and self-esteem, and a different outlook on the world as a result of the projects we did."

"Telecommunications need to be used across the curriculum, and many teachers are still not computer literate, which means that using telecommunications requires a steep learning [curve]," says Barbara Kurshan, a computer education consultant with Educorp Consultants of Roanoke, VA. "In reality, getting connected to a network is still quite complicated. It is similar to the problem early computer users had with printers. There are just too many details and too many things that can go wrong."

But, she adds, "teachers, however, are sticking with it because telecommunications provide solutions to many educational problems such as teacher isolation, global education programs, writing for a purpose, and using computers—*not* just to learn about computers."

Kurshan worked on one project through the Technical Education Resources Centers in Cambridge, MA, that linked students in rural Colorado with students in a class for potential dropouts in a poor neighborhood in the Bronx. Students in both classes were asked to look out their windows and send electronic messages describing what they saw. The Bronx students "described the real drug scene in the alley they saw below the window," she says. "The rural students described the mountains and the fields. Imagine the cultural shock on both sides. The network provided a way to explore cultures that both groups of students would never experience."

Delzeit says that for educational telecomputing to really work, students will have to have access to a network at both home and school, "where kids will see that you utilize telecommunications for more than educational tasks. Where kids will have the ability to explore, discover, and learn on their own time." ■

A rapidly increasing number of online projects connects students around the world, where they exchange letters in each other's languages, conduct joint science and environmental projects, and consult with experts from universities and corporations.

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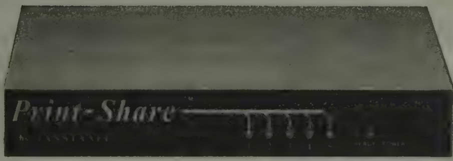

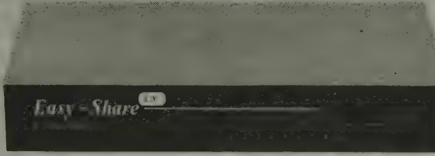

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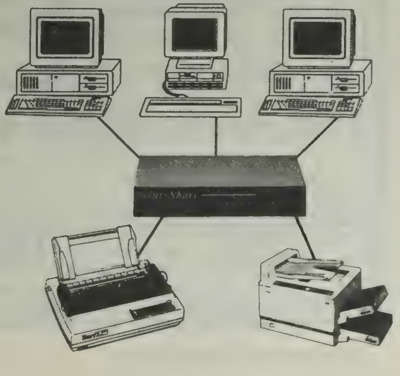

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RESOURCES:

A growing number of agencies, educational groups, and teachers provide online programs for teachers and students. Some provide highly structured and detailed curricula and programs, often for a fee; others are essentially online meeting places where teachers and students can gather to create their own projects.

•The California Technology Project, a joint venture of California State University and the state Department of Education, runs the Technology Resources in Education network, which offers K–12 access to online conferences and databases, library catalogs, NASA information, and CNN program guides.

Craig Blurton,
Director
California
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Continued next page

Telecomm In The Classroom

Some examples of current projects:

•The National Public Telecomputing Network, which links community computing systems through one known as Cleveland Freenet, has run a "virtual track meet" among 2500 students in seventeen schools in four countries, where schools send in their best results from events.

•Regine Fougeres, a teacher at Schenley High School in Pittsburgh, said her students started corresponding with students in Canada; some continued to write even in the summer.

•Last year, fifteen student teachers in Long Beach, Cerritos, and Huntington Beach were given Macintoshes, donated by Apple, as part of a project to see if computer networks could improve communications between professors and student teachers, and whether having a computer in their home would help the student teachers integrate the use of computers into their daily work.

Jean Casey, an assistant professor in teacher education at California State University at Long Beach, oversaw the program. "As soon as everyone discovered how much easier it was to send a message this new way and avoid many attempts at phonetag, the participation grew. Then with information put on the system by the project director that included hints for lesson design, activities, job availability, and other such 'carrots of wisdom,' the participants discovered the value of this resource. At the end of the first semester, 100% of the participants recommended continuation of the project."

•St. John's University in New York runs a Big Computer Pals program that creates "a Big Brother/Sister relationship between older and younger handicapped individuals with the goal of developing student-mentor relationships," according to Bob Zenhausern, a professor there. "Older, more experienced handicapped individuals share what they have learned with those younger, and the disability actually serves as an empathic bond between the two." As one example, a blind New York college professor now regularly communicates with a visually impaired and "retarded" high school student in rural Virginia, he says.

•Last year, Clay Good, a journalism teacher at Juneau-Douglas High School in Juneau, AK, created a student "wire service" that received and distributed news and feature stories from students in several countries, including the Soviet Union.

•Lynda Meenan, a middle-school teacher in Ashland, MA, is helping to coordinate an international weather survey, through K12Net, carried by the Fidonet system. Students will detail their local weather conditions.

—Adam Gaffin

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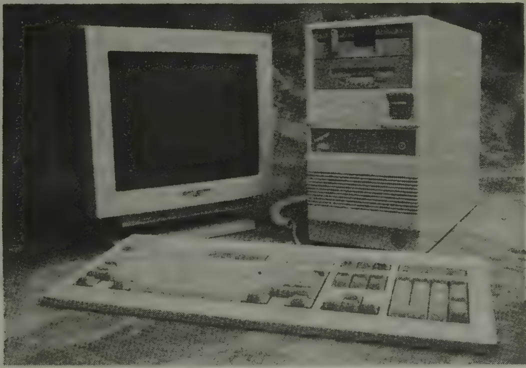

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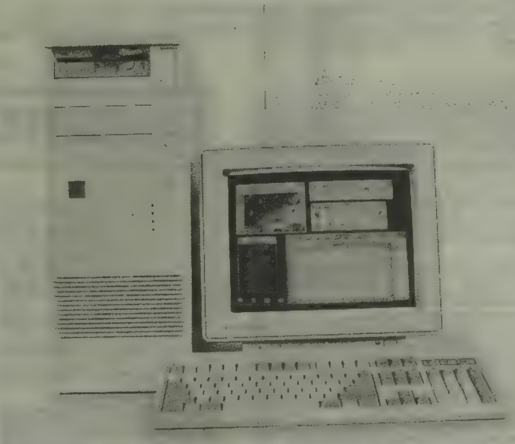
101 Keys Keyboard



286 12MHz $275

- Mini Tower Case
200W. Power Supply
286 12MHz Main Board
1 MB Main Memory Installed
IDE Floppy Disk/Hard Disk Controller
1.2MB Floppy Drive
2 Serial, 1 parallel Printer Port
101 Keys Keyboard

286 16MHz $300

- Mini Tower Case
200W. Power Supply
286 16MHz Main Board
1 MB Main Memory Installed
IDE Floppy Disk/Hard Disk Controller
1.2MB Floppy Drive
2 Serial, 1 parallel Printer Port
101 Keys Keyboard

VISA AND MASTER CARD ACCEPTED

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- Bank Card Service Charge Applies

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* GOLD STAR 14" VGA COLOR MONITOR w/ VGA COLOR GRAPHIC CARD	$315
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* ADI MICROSCAN 14" SUPER VGA MONITOR w/ TRIDENT SVGA CARD + 1MB VRAN (1024 x 768 Res., 0.28mm)	$470

HARD DISK

* 1.44MB (3-1/2') H.D. FLOPPY DRIVE	$ 60
* PLUS QUANTUM 52MB HARD DISK (17ms)	$200
* PLUS QUANTUM 85MB HARD DISK (17ms)	$285
* PLUS QUANTUM 105MB HARD DISK (17ms)	$320
* CORNER 120MB HARD DISK (15ms)	$345
* CORNER 200MB HARD DISK (15ms)	$555
* PLUS QUANTUM 210MB HARD DISK (17ms)	$585

Resources continued from previous page

Internet: cblurton@atl.calstate.edu

•The Technical Education Research Centers provide science curricula and online projects through its STAR School program.

STAR School Program
2067 Massachusetts Ave.
Cambridge, MA 02140
(617)547-0430

Iris Online Community of Educators provides online conferences and projects; costs $265 a year, which includes ten hours of access via SprintNet; has access to other networks, including Bitnet and Internet; and participates in and coordinates international projects.

Iris Online Community of Educators
PO Box 29424
Richmond, VA 23229
(202)298-0969
Internet: iris@tmn.uu.net.

•The National Public Telecomputing Network, run through Cleveland Freenet, also offers online conferences and projects.

Linda Delzeit, Director of Education
NPTN-California
6330 Lincoln Ave., No. 117
Cypress, CA 90630
Internet: aa621@cleveland.freenet.edu.

•The National Geographic Society runs a series of eight-week projects on such topics as acid rain, weather, and garbage through its Kids' Network. Schools are teamed with other schools, and with a scientist who helps analyze the results. Costs are between $325 or $375 for a startup kit; $97.50 for each unit. Software is for Apple IIgs, but IBM and Macintosh software are planned for next year.

National Geographic Society
Educational Services
Washington, D.C. 20090
800-368-2728, 5 am to 1 pm, Pacific time, Mon.–Fri.

•Kidsnet is a Bitnet discussion group on educational uses of computer networks. To subscribe, send an email message to listserv@vms.cis.pitt.edu. Leave the "subject:" line blank, and send this as the entire message: "SUB KIDS-L Your Name."

•The International Society for Technology in Education has a variety of special interest groups, including one on Telecommunications in Education, and sells a number of telecommunications related books and services, including discounted use of SprintNet email. Basic ISTE membership is $46 for adults, $23 for students. Add $16 ($8 for students) for the quarterly *Telecommunications in Education* newsletter. Among their books is *Telecommunications in the Classroom*, by Chris Clark, Barbara Kurshan, and Sharon Yoder, which offers advice on setting up educational telecommunications projects: $10 plus $2.85 shipping.

ISTE
University of Oregon
1787 Agate St.
Eugene, OR 97403
(503)346-4414
Email: iste@oregon.bitnet or 70014,2117 on CompuServe

•FrEdMail is an international educational network that links Apple II-based BBSes. A mail gateway to Internet is also available. In the Bay Area, Industry Initiatives for Science and Mathe Education runs a BBS that connects to the network at (510)643-6258. Other BBSes tied to the network can be reaced in Oakland at (510)834-2636 and in San Jose at (408)946-7325; (408)942-1425; (408)253-5385; and (408)259-6855.

Bob Shayler
26970 Hayward Blvd., #211
Hayward, CA 94542-2073
Emai: bshayler@tmn.com
Al Rogers
FrEdMail Foundation
PO Box 243
Bonita, CA 91908-0243
(619)475-4852
Email: arogers%bonita.fred.org@cerf.net

•K12Net is a free series of conferences carried by more than ninety bulletin board system, as well as many Usenct sites, around the world. It features "channels" for various projects, as well as general conferences in areas from science to foreign languages. In California, BBSes that carry K12Net include:

Gentle Rain BBS, Claremont, (714)593-6144
Castle of the Four Winds BBS, Diamond Bar, (714)860-3213
GesherNet, West Hills, (818)340-4374
Sacramento Peace Child, Sacramento, (916)451-0225.

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WIN45 1700 Icons (3) in 32 Categories
ED36 Computer guide to Solar System
GE4 Brothers Keeper 5.0 (3) Best Geneology
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GU9 Show Partner Lite 3.7 (2) Make Presentations
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E1 PC Write Standard Level 2 (4 Disks)
EGA91 Chinese Checkers-Great Graphic 1 to 6 players
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486-25 w/128K Cache	$849
486-33 w/64K Cache	$868
486-33 w/128K Cache	$919
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Additional Floppy Drive	54
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External 2400 Modem	68

Monitors & Cards

14" Super VGA (1024X768)	$275
14" VGA (800X600)	225
Super VGA Card/256K	53
Super VGA Card/1MB	79
Standard VGA Card/256K	39

Motherboards w/CPU

286-16 MHz	$79
386SX-16 MHz	168
386-25 MHz	285
386-33 MHz / 64K Cache	369
486-25 MHz / 128K Cache	645
486-33 MHz / 64K Cache	679
486-33 MHz / 128K Cache	695
486-33 MHz / 256K Cache	755

Printers

KXP-1180 (9 pin)	$152
KXP-1123 (24 pin)	218
KXP-1124i (24 pin)	285
KXP-1624 (24 pin)	359

Math Coprocessors

INTEL 80387-16SX	$133
INTEL 80387-20SX	143
INTEL 80387-20DX	179
INTEL 80387-25DX	199
INTEL 80387-33DX	215

Accessories

3-Button Serial Mouse	$18
Mouse Pad	2.2
Printer Stand (2 pcs)	4.9
Printer Stand w/Adjustable Tray	10
Monitor Stand	9.5
Monitor Arm	59
14" Color Monitor Screen Filter	9.5
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Keyboard Dust Cover	2.5
Printer Dust Cover	3.5
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- Intel 486-25/33 CPU
- Intel Chipset
- Built in Coprocessor
- 8K Internal cache
- 256K External Cache
- 4 MB RAM exp to 32 MB on board (70ns)
- 200 MB Hard Drive
- 5.25″ (1.2 MB) TEAC floppy drive
- 3.5″ (1.44 MB) TEAC floppy drive
- IDE FDD/HDD controller
- 2 serial, 1 parallel, 1 game port
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- 256K External cache
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- Ultrastor ESDI FDD/HDD with 32K cache controller
- 5.25″ (1.2 MB) TEAC floppy drive
- 3.5″ (1.44 MB) TEAC floppy drive
- 2 serial, 1 parallel, 1 game port
- 16 bit SVGA card with 1 MB
- 14″ SVGA Monitor (1024x768 .28)
- 101 enhanced keyboard
- Full Tower Case w/250W Power Supply
- MS-DOS manual

25 MHz $3788
33 MHz $3988

MLS TOWER 386-33/40

Standard Configuration

- Intel 386/33 CPU
- Socket for coprocessor
- 64K Cache RAM
- 4 MB RAM exp to 32 MB (70ns)
- 120 MB hard drive (19ms)
- 5.25″ (1.2 MB) TEAC floppy drive
- 3.5″ (1.44 MB) TEAC floppy drive
- IDE FDD/HDD controller
- 2 serial, 1 parallel, 1 game port
- 14″ Super VGA monitor (1024x768 .28mm)
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Years on Motherboard / Year on the Other Parts

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LANDMARK=34 MHz
- 1 MB RAM Exp to 16 MB
- 40 MB Hard Disk 25ms
- 1.2 MB or 1.44 MB TEAC Floppy Drive
- IDE Controller
- Mono or VGA Monitor
- MGP Or 16-Bit VGA Card 1024x768 w/512K
- 2S/1P/1G
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LANDMARK=21 MHz
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- 1.2 MB or 1.44 MB TEAC Floppy Drive
- IDE Controller
- Mono or VGA Monitor 1024x768
- MGP Or 16-Bit VGA Card 1024x768 w/512K
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- MGP or 16-Bit VGA Card
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- 1.2 MB TEAC Floppy Drive
- 40 MB Hard Disk 25ms
- Hard/Floppy Controller
- 2S/1P Ports
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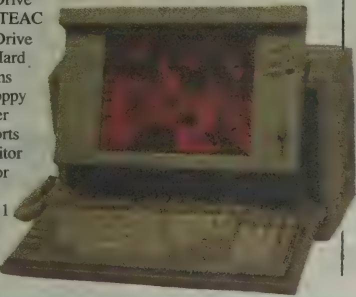

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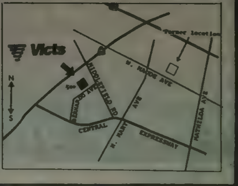

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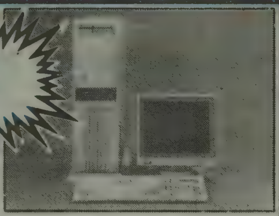

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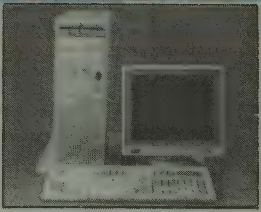

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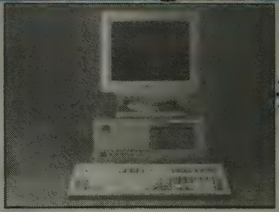

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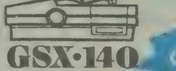

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9600/2400 FAX MODEM	~~159~~	$95
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101 KEYBOARD	~~39~~	$25
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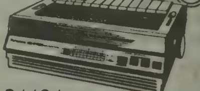

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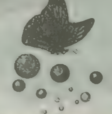

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Berkeley's Community Memory Project

Building A New Kind Of Neighborhood

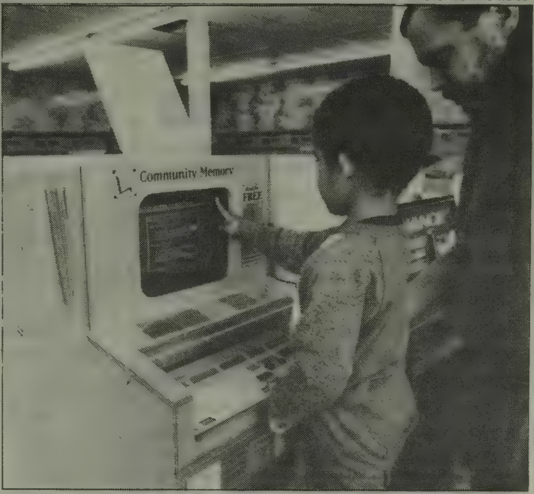
BY ANNA COUEY

If you walk into Milt's Coin-Op laundromat in Berkeley, you'll see a computer terminal. Enter a few keystrokes, and you'll find yourself inside Community Memory, a public access bulletin board system that you can read for free and post to for only 25 cents.

Community Memory is a project that began in the early '70s to facilitate the growth of true community, using the non-hierarchical communications that computer networks provide. According to Lee Felsenstein, one of its founders and visionaries, it's "probably the first system described as 'an electronic bulletin board.'" The project has designed and developed its own bulletin board software, built and installed ten public access terminals, and is now experimenting with dial-in access.

At the same time, it's experimenting with community development. CM's pioneering work has influenced a host of subsequent computer communication systems, including the Whole Earth 'Lectronic Link (WELL). It's committed to facilitating communications between diverse social groups, right in the neighborhood.

PHOTO: RICHARD WEISS



Community Memory's interface is accessible to people of varied ages, cultures, and interests.

ROOTS

The idea for Community Memory grew out of a project initiated by Resource One, which Felsenstein describes as "an effort by four computer science students who had abandoned UC Berkeley during the Cambodia crisis to bring the power of computers to assist the efforts of community-building that were the outgrowth of the '60s."

Resource One had secured the donation of an obsolete SDS-940 timesharing computer; its vision was to develop a computerized file system for use by Bay Area switchboards, community-based information-referral agencies.

After they'd set up the computer and written the information retrieval package, however, Resource One encountered a crushing setback—the switchboards were struggling with personnel burnout, and could not take on the burden of renting a Teletype for $150 a month and dedicating personnel to entering all their records. Resource One, Felsenstein says, "was left with a machine without a mission."

But it was a machine with a system, and was shown to a group of reference librarians. While the meeting itself was unsuccessful, it inspired Efrem Lipkin to conceive of the model for Community Memory. As Felsenstein describes it, after the librarians "commented that we seemed to have a set of shelves with no books, and they would be more interested if there were books, Efrem came up with the idea that we could place terminals in public places and collect interesting information as a bulletin board." Jude Milhon and Mark Szpakowski assisted in the development of application software, and on August 12, 1973, Community Memory made its first public appearance—in front of Leopold Records in Berkeley.

LOG IN AND MEET YOUR NEIGHBOR

Almost twenty years later, Community Memory is a thriving system that features information and discussions. Each month, 2000 users participate, including individuals from a variety of economic classes, community and educational organizations, and local government.

As I browsed the system, I found job listings; community resources and services; news items; events listings and informal reviews; a discussion on anarchy; a PTA forum; andthe Alameda County Veterans' Memorial, an electronic monument in the making, comprised of information records and personal reminiscences that can be referenced by name, rank, gender, type of casualty, etc.

A big plus of Community Memory is the diversity of viewpoints—I read a lively discussion about the recent demonstrations in People's Park, where opinions ranged from "homeless people should get a life" to "the system kills creative minds that participate in it, it owes us a living."

Evelyn Pine, Community Memory's executive director, describes the project's commitment to "remake geographic communities" by making it easier for people of different socioeconomic backgrounds to communicate, and by providing media access and services to individuals who otherwise are not counted as "opinion makers." Some Community Memory users develop online relationships around a passionate shared interest, and later discover that the person they've been communicating with is homeless. "That's a life-shaking revelation," says Pine. She stresses that "often the person we need to talk to...is the person down the block who may scare the hell out of us face to face, but we communicate online...and then discover, 'Oh my goodness, we share the same feelings about things.'"

However, the project developers are also very aware that it takes more than access to rebuild communities with technical tools. Pine describes the tendency of individuals to be intimidated by "expert opinions," and to be readers rather than participants. "People have real difficulty with the idea that Community Memory and a lot of BBSes are based on—the idea that you and your own experience are the single most valuable source of information that you have and your community has." Part of the challenge of building community is nurturing open participation.

SOFTWARE FOR INTERACTION

Community Memory's software is designed with naive users in

RESOURCES:

Community Memory is a nonprofit organization. For further information, access them at one of their Berkeley terminals, or contact:

The Community Memory Project
2617 San Pablo Ave.
Berkeley, CA 94702
(510)841-1114

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Anna Couey (couey@well.sf.ca.us) is a writer and artist who uses telecommunications as a medium for engendering new cultural and social constructs.

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mind—and they've found that people will just walk up and use it. It's also structured on a very different communications model than the dominant BBS paradigm, which Felsenstein likens to a scroll that you have to read all the way to the end before you can respond.

In contrast, Community Memory employs a multidimensional hypertext. A response is cross-referenced by as many key words as necessary, and you can invent new ones. Responses are linked in threads as well as general topics, and it's very easy to jump from one thread to another, or retrieve information that might otherwise be buried in a nonrelated topic. "Community Memory allows for interactions between users, similar to those which take place in a large group, like an unruly audience," says Felsenstein. "People throw out comments and see who answers them, or overhear others and break in if it suits their fancy. People follow a thread for a while and then wander off in pursuit of another one. The existing paradigm is that everyone sits still and listens to one person expound. Great for universities, but not the way life is lived in public."

Community Memory software includes other design innovations that facilitate speedy access, increase the number of simultaneous users, and allow users to edit their messages after posting. It will be commercially available in the near future.

Currently, Community Memory is focused on sharing its experience in community building, and expanding the project's base in Berkeley. Felsenstein is working to start a Community Memory project in the Soviet Union, "where the outlines of possibilities for the society of the next century will start to take shape." Closer to home, the group is developing a coalition of Berkeley institutions—ideally including local government, educational institutions, technical groups, as well as small nonprofits—to coordinate the management of Community Memory and allow government, individuals, and grassroots organizations to work together.

The project also plans to coordinate its activities with other community BBS projects, as well as with international networks. Here again, cultural and social issues are the real challenge.

"It's less easy than we thought," says Carl Farrington, the system's technical director, "When we actually started looking at specific examples, we found that there were cultural differences, that a cultural system develops around some physical system. When you take messages from (one system) and embed them in some other system, where there's a different culture of how people talk, they don't just translate straight across."

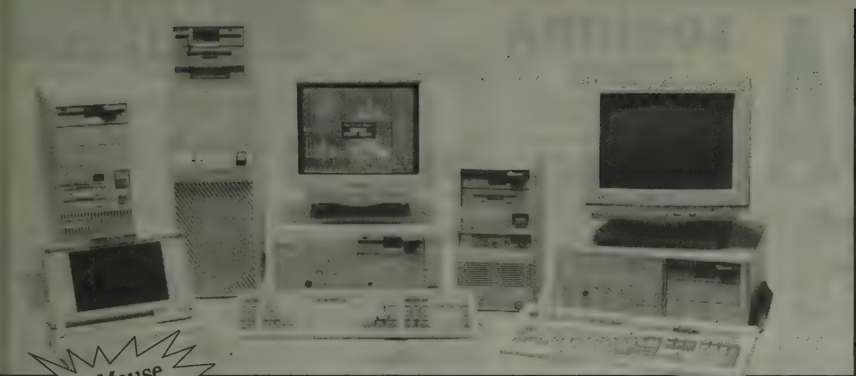
Lee Felsenstein: "Community Memory allows for interactions between users, similar to those which take place in a large group, like an unruly audience. People throw out comments and see who answers them, or overhear others and break in if it suits their fancy."

Underscoring Community Memory's activities is a conception that it's more productive to have many self-sustaining and overlapping interest groups created by ordinary people than a centralized national public access network—and the group puts its ideas to work to make sure.

Felsenstein writes, "Nearly twenty years in the building, and it's built right. Now we have to toss it out and let people amaze us with the wonderful ways they use it." ■

You'll find Community Memory terminals in the following locations in Berkeley:

Central Library, Shattuck and Kittredge
Claremont Library, 2940 Benvenue (at Ashby)
South Library, 1901 Russell (at MLK Jr. Way)
West Library, 1125 University (near San Pablo)
International House, 2299 Piedmont (at Bancroft Way)
North Berkeley Senior Center, 1901 Hearst (at MLK Jr. Way)
Milt's Coin-Op, 3055 Telegraph (at Webster), 24-hour access!
Milt's Coin-Op II, 2483 Hearst (at Euclid)
Ecology Center Complex, 2530 San Pablo (between Parker and Blake)
South Berkeley Neighborhood Development Corp., 1767 Alcatraz (near Adeline)



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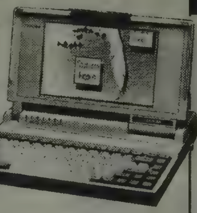

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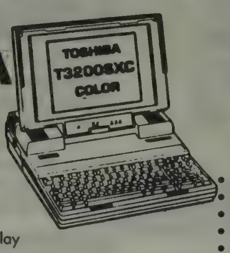

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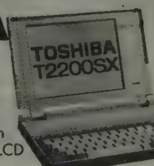

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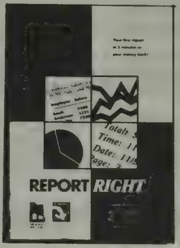

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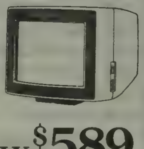

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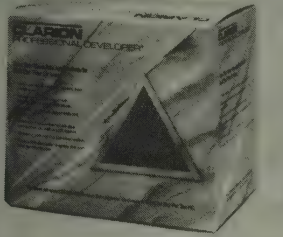

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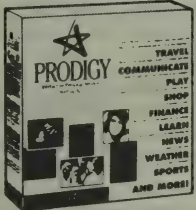

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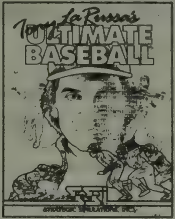
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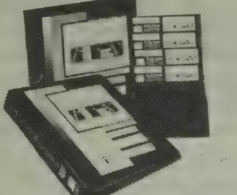

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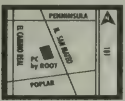

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Cyberpunk

Investigative Reporters Hafner And Markoff Raise More Questions Than Answers

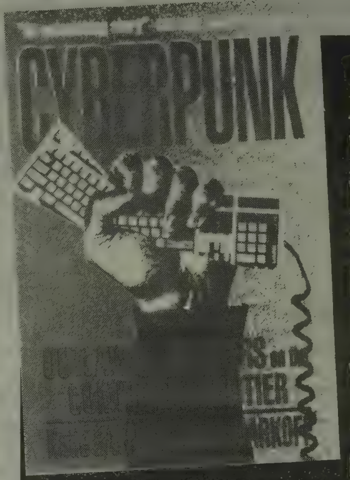
BY MARY EISENHART

When the Bell Labs trio arrived, Anne Morris began steering reporters in their direction, letting the journalists know just what sort of eminent scientists had taken the trouble to make the trip to Syracuse...The reporters clustered around [Ken] Thompson [principal co-author, along with Dennis Ritchie, of UNIX], perhaps the best known among computer scientists...Bob Morris [Sr.] stood by and watched in amusement, twirling a cigarette in his fingers. When Thompson remarked that he thought [Morris Jr.'s] release of the worm was an irresponsible act, Morris grinned and spoke up: "Have you ever done anything like that, Ken?"

It was peculiar that these of all people would be assembled in a court of law in the first place. The group provided more than just a technical reference point: they were the people behind the theoretical debates over technological morality and intellectual property. Their presence was a reminder of a long-standing tradition among computer security experts that one earns one's stripes in the field by defeating a computer's barriers. But that was in the old days, when the community was far smaller, when computers weren't ubiquitous, when the stakes were much lower, when breaching security was still considered to be all in the spirit of science.

—Hafner/Markoff, *Cyberpunk*

If you've spent any time in the computer world in the last few years, you're already aware of the range and ferocity of debate on the subject of telephone-based computer "crime," ranging from unauthorized snooping on unsecured systems to unauthorized transfer of large sums of money. Not to mention unpaid-for global phone calls, online fraud, vindictive alteration of tax, credit, and personnel records, etc., etc. Reading *Cyberpunk* will leave you with new insight into the world of modem-using outlaws. It will also leave you with far more questions than answers, and a lively, if troubled, appreciation of the complex social and ethical issues involved.



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In *Cyberpunk*, Katie Hafner and John Markoff examine three characters behind the headlines of the last few years, people who differ from each other as much as they differ from the randomly selected individual on the street. Southern California's Kevin Mitnick, characterized as an archetypal "dark side" hacker, engaged in system-cracking activities ranging from petty vandalism to record alteration to the theft of DEC's source code for the VMS operating system. Hans "Pengo" Hübner, a West Berlin teenager, was part of the ring that broke into US military computers and sold interesting files to the Soviets (a story told, from another perspective, in Cliff Stoll's bestseller *The Cuckoo's Egg*). Robert Morris, Jr., son of an NSA security expert, unleashed the "worm" that brought most of the Internet to a standstill three years ago.

The stories are extensively researched and benefit from the authors' inside knowledge of the computer world (Markoff, who writes about computers for the *New York Times*, was the first to discover and publish Morris Jr.'s identity at the time of the Internet Worm incident). Markoff and Hafner have taken great pains to present people and events from the full range of perspectives (with occasional gaps—Mitnick, for instance, declined to be interviewed) and to refrain from editorializing.

Therein lies a good deal of the book's power. It doesn't let you see "computer criminals" as one-dimensional cartoons. Mitnick comes across as both sociopathic and pathetic, Pengo as a smart-but-clueless young punk, and both of them as making the conscious decision to commit mayhem. Morris, on the other hand, arguably did more damage than the other two with what was, essentially, an experiment gone awry, never thinking it might be illegal.

The chapter on Morris is, in a sense, the most troubling and most revealing of the complexities of computer culture over the last few decades. Mitnick and Pengo might reasonably (if a bit superficially) be dismissed as criminals who happened to use computers and modems as their tool of choice. Morris, on the other hand, is the brilliant son of a brilliant father, who just happens to be one of the top-secret National Security Agency's chief wizards. When you grow up at Bell Labs and the NSA with computers as your Tinkertoys, when eavesdropping and breaking into systems (on the government payroll) is what your father and his colleagues *do*, when you yourself as a teenager give a classified presentation to a top-secret audience on how to break into systems and not get caught—your perspective on other people's right to the secure and private use of their computer systems might not be too typical.

Cyberpunk is a good, and disturbing, read, accessible to technically unsophisticated readers as well as to the online activists, system administrators, security consultants, and others who work in the computer industry. It will improve your understanding of system security—and of those who try to breach it. It will leave you with very few pat answers. (*Cyberpunk: Outlaws and Hackers on the Computer Frontier*, by Katie Hafner and John Markoff, Simon & Schuster 1991, ISBN 0-671-68322-5. $22.95) ■

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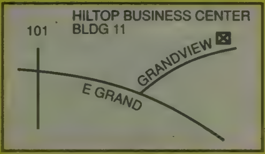

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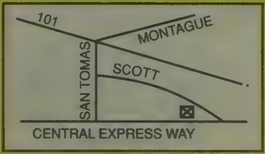

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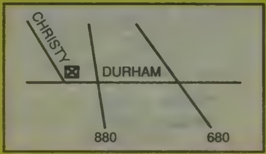

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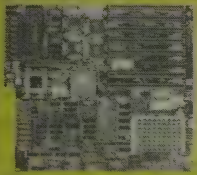

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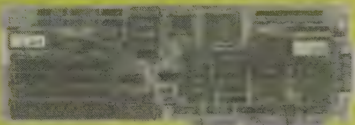
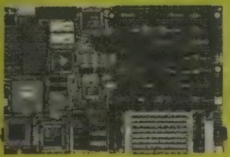


Baby-Voyager 33MHz 486 ISA Motherboard



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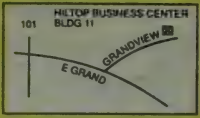

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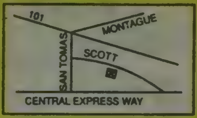

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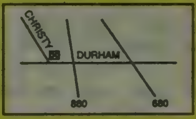

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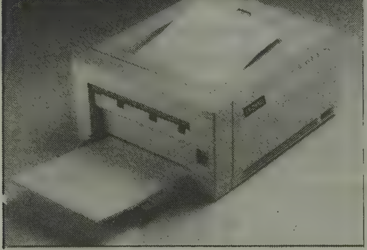

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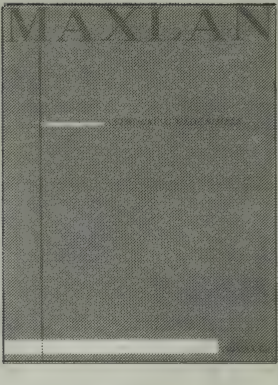

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- ➤**Farallon Computing** released **Timbuktu/Remote 3.0**. This screen-sharing and file transfer software now features color screen sharing over modems, autoscrolling, and simplified password capabilities. Farallon Computing, Inc., (510)596-9000.
- ➤**hDC Computer** released **IconDesigner 2.0**, a design studio for creating or modifying icons in Windows. The upgrade price for registered users is $14.95. hDC Computer Corp., 6742 185th Ave. N.E., Redmond, WA 98052. (206)885-5550.
- ➤Each new package of **Microsoft Works** will include a free coupon for **Intuit Quicken 3.0**. Although Quicken is offered at no charge, users will be responsible for the $5.50 shipping and handling cost. This offer will be available through January 31, 1992. Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (206)882-8080.
- ➤**Super PC-Kwik**, the disk caching program from **Multisoft Corp.**, will be included in **DR DOS 6.0**. Multisoft Corp., 15100 S.W. Koll Pkwy., Suite L, Beaverton, OR 97006. (503)644-5644.
- ➤**Parsons Technology's Resident Expert for All Versions of DOS**, the online hypertext format program linking keywords for instant access to information on topics or subtopics, now includes MS-DOS 5.0 commands. Parsons Technology, Inc., One Parsons Dr., PO Box 100, Hiawatha, IA 52233-0100. (319)395-9626.
- ➤**Practical Peripherals** will include **CheckFree** bill payment software and one free month of free service with all new modem purchases. Regular CheckFree service is $9.95 per month for up to twenty payments and $3.50 per additional ten payments, or any portion thereof. Practical Peripherals, Inc., 31245 La Baya Dr., Westlake Village, CA 91362. (818)706-0333.
- ➤**Qualitas** announced new versions of **386MAX v6** and **BlueMAX v6**, its DOS memory management utilities. Owners of earlier versions may upgrade for $29.95. Qualitas, Inc., 7101 Wisconsin Ave., Suite 1386, Bethesda, MD 20814. (301)907-6700.
- ➤**Toshiba** is offering a **free MS-DOS 5.0 upgrade** for owners who purchased any Toshiba portable computer on or after September 1, 1991. Customers who purchased their portables prior to September 1, 1991, or after November 30, 1991, may buy an MS-DOS upgrade kit for $49.99. This program is effective through March 31, 1992. Toshiba America, Inc., 1-800-441-5503.
- ➤**Triticom** released enhancements to its entire line of its **LANVision Traffic Monitor Software—EtherVision 2.1**, **TokenVision 2.1**, and **ArcVision 2.1**. Triticom, Inc., Box 444180, Eden Prairie, MN 55344. (617)937-0772.
- ➤**WordTech** is shipping **VP-Expert 3.0**, the latest version of its rule-based expert system development tool. Existing users can upgrade for $129. WordTech Systems, Inc., 21 Altarinda Rd., Orinda, CA 94563. (510)254-0900.
- ➤**XTreeGold v2.5**, by **XTree Co.**, includes thirteen graphic file viewers, new time-saving command options, and other usability enhancements. XTreeGold users who acquired their software, or upgraded from a previous version, on or after July 15, 1991, will receive an upgrade free. Other XTreeGold 2.0 users can upgrade for $19.95 plus $4.95 shipping and handling. Owners of any XTree product can upgrade for $39.95 plus $4.95 shipping and handling. XTree Co., 4330 Santa Fe Rd., San Luis Obispo, CA 93401. 1-800-282-5003, ext. 990.

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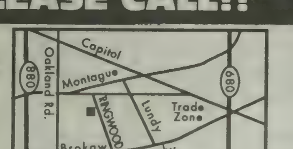

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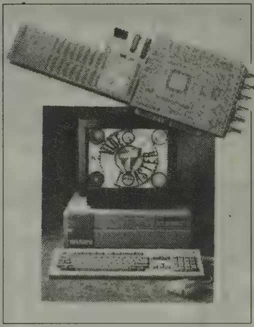

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GAME REVIEWS

By Mike Markowitz

THE TREEHOUSE

Designed By: Leslie Grimm and Lynn Kirkpatrick
Published By: Brøderbund
For: IBM PC and compatibles (640K, VGA, EGA, MCGA or Tandy graphics, mouse, joystick, and most audio cards supported). Macintosh and Apple II versions planned for Spring '92 release
List Price: $59.95

The Treehouse is certainly more than a set of games, and something less than the interactive multimedia learning environment that its marketing hype might suggest. I would describe it as a set of activities designed by people who have thought very deeply about how kids aged 6 to 10 can use computers effectively. For example, an "Even Steven" setting allows children of different grade levels to play the same game on equal terms—fairness is something really important to kids. Treehouse is the natural sequel to The Playroom (which was designed for even younger users). Treehouse is the product of a talented team of programmers, graphic artists, sound engineers, and educational consultants. These people were clearly given a lot of resources. As with some Hollywood films, you can almost smell the

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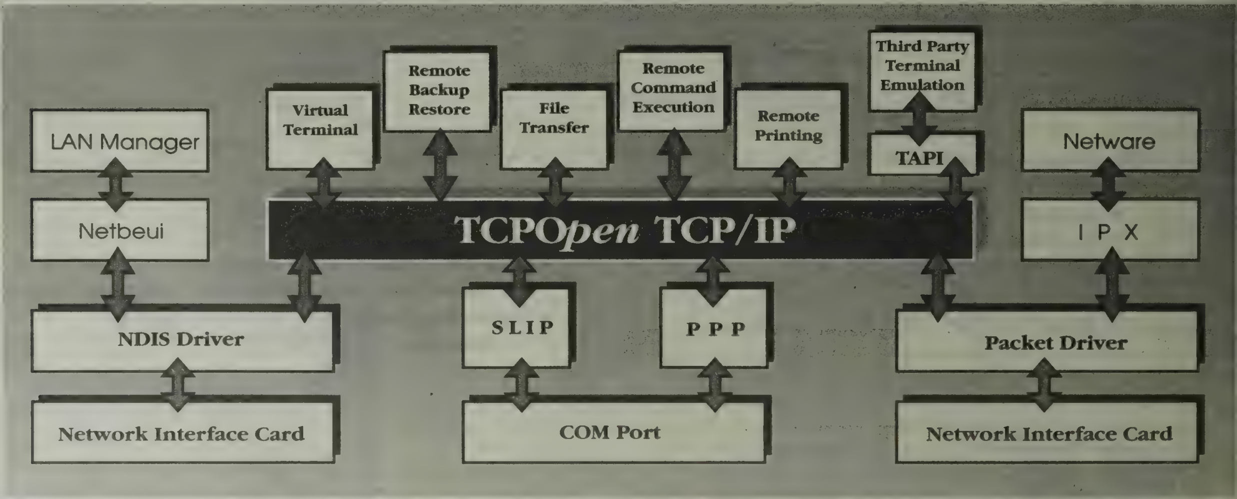
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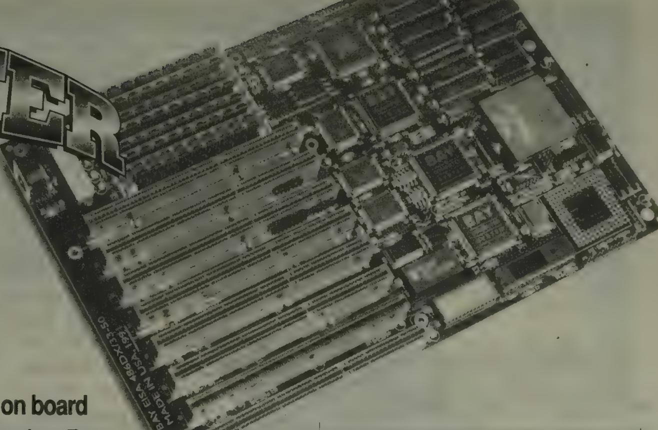

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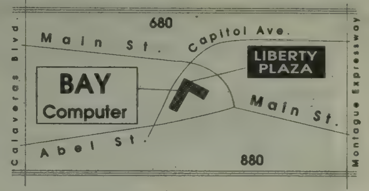

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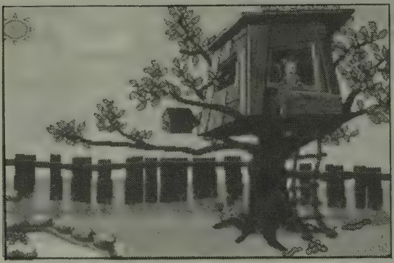
A curriculum designer might classify the program's activities as music, biology, math, language, history, art, and logic; but to a kid, it will definitely feel like messing around and having fun. The Treehouse is a very permissive, open-ended sort of place that never locks you into an activity. This is ideal for the short attention spans of the third Television generation.

Tying the program together are male and female cartoon animals—the Awesome Possums. You can feed them, and they occasionally need to take naps. The Treehouse is full of surprises. Click on a cloud and it changes shape. Drop a nut and a squirrel runs out to pick it up. Clicking on certain objects transports you into an activity—for example, the keyboard sends you to the music activities, and the game board sends you to the Road Rally, an arithmetic game in which you plan your path to collect the greatest number of tokens.



I particularly liked the Treehouse Theater, where you construct pictures by building pattern sentences from different parts of speech: "who," "does what," "where," and "when." You can then drag additional "props" into the picture to customize it.

In some activities you win "prizes," like floating balloons that accompany you back to the Treehouse. They seem to become permanent fixtures—I can't figure out how to get rid of them.

Although the program can be controlled with mouse, joystick, or keyboard, I found using the keyboard to be excruciatingly awkward. Digitized sound and music are an important part of the program (in the program's directory listing, the file DIGISND.DAT takes up 1,113,437 bytes!). Since the built-in sound on most (non-Tandy) PCs is so pathetic, an audio card is highly recommended. The program supports the Sound Blaster, AdLib, Disney Sound Source, Covox Sound Master, and similar devices.

The package includes three high-density (1.2MB) and five 3.5" (720K) disks. There is also a short audio cassette tape of the program's theme song. Documentation includes a 68-page program guide (oriented toward teachers and parents) and a 32-page Kids Guide and Songbook. When installed, the program takes up about 3MB of hard disk space.

For users with appropriate hardware (VGA graphics, mouse, and a sound card), The Treehouse represents the current state of the art in positive, nonviolent software for the 6–10 age group. The Macintosh version will support sound recording on systems that include a microphone. The Apple II ver-

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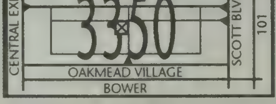

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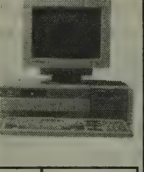

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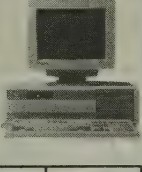

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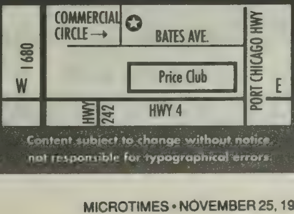

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sion, constrained to the limits of 128K, will have fewer features and activities.

SIMANT

Designed By: Will Wright and Justin McCormick
Published By: Maxis
For: Macintosh (1MB monochrome, 2MB color), IBM and Amiga versions to be released in late 1991
List Price: $59.95

SimAnt
Maxis
The Electronic Ant Colony

Since the first caveman pondered the mysteries of the beehive while trying to steal honey without getting lethally stung, the "social" insects have been a great source of inspiration and metaphor for thinking about societies in general. Evolution has given the social insects many advantages we lack—they communicate with swift and precise chemical signals while we have only halting, ambiguous language. Their behavior is guided by finely honed instincts, while we stumble along with feeble reasoning and ill-adapted emotions.

The ant farm is a staple of elementary school biology and stand-up comedy. Sandwiched between plates of glass, any limited artificial environment can only teach limited and artificial lessons. Software, on the other hand, is constrained only by the limits of RAM, CPU cycles, and imagination. The team that created the wonderful software toys, SimCity and SimEarth, has now given us an electronic ant farm, with a limitless supply of virtual insects that can never escape from the computer to ravage your kitchen.

We evaluated a late beta-test version of the software. Once a few INIT conflicts were resolved, it ran without problems on a Mac LC, a IIsi, and a IIci. The color version runs much faster in 16-color mode, so if your monitor's control panel is set for a higher number, the program gently reminds you to change it. The final release includes two disks with separate color and monochrome versions of the program. The color version came as a self-extracting CompactPro archive and took up 1100K of disk space after installation.

SimAnt can be played on several different levels. An interactive Tutorial walks you through the mechanics of a Quick Game: digging tunnels, foraging for food, and doing battle with the evil empire of the Red ants across the yard. In the Full Game you start with one Black colony and one Red colony and your goal is to establish control over the entire yard and the adjoining house.

You can view events from the micro-level perspective of a single ant

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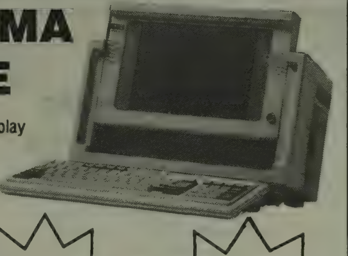

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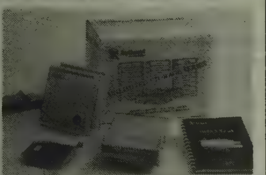

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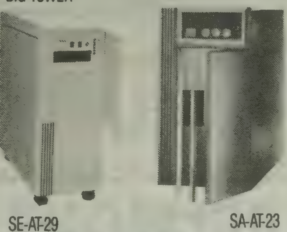

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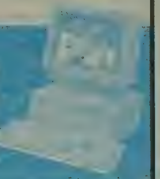

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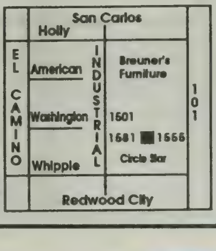

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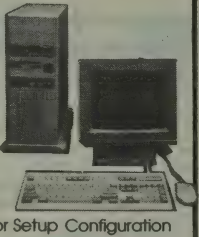

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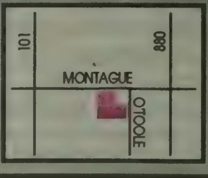


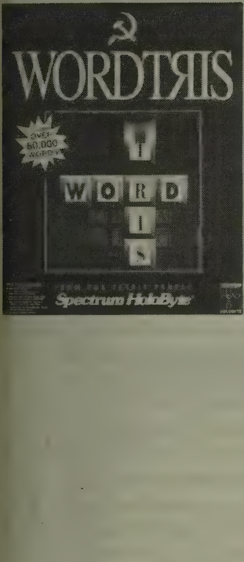
inside the nest, or zoom out to increasingly expansive overhead views of your local patch or the entire yard. The game controls are graphic and intuitive—for example the Behavior Control window lets you allocate relative efforts of your colony between foraging, digging, and breeding.

The game presents a lot of solid scientific information while retaining a sense of humor. Users who are squeamish about insects may find some of the graphics, well, a little too graphic. The game has extensive online Help to explain its many features. A HyperCard-based reference system provides lots of information about ants. The illustrated 175-page manual is excellent.

I couldn't help wondering whether the program has hooks for add-on modules like SimBee or SimTermite. SimAnt may do for entomology what SimCity did for urban planning.

WORDTRIS

Designed By: Sergei L. Utkin and Vjacheslav A. Tsoy
Published By: Spectrum Holobyte
For: IBM PC compatibles (640K, CGA, Hercules, EGA, or VGA graphics, supports popular sound cards)
List Price: $44.95



Just when you thought there was no way to do another game based on blocks falling into a well, Wordtris arrives, fresh from the falling Soviet empire. Wordtris was born of the unnatural union of Welltris with a spell checker.

Each falling block is stamped with a letter, and as they fall you have to shift them left or right, attempting to form words. The well is half filled with water, and the blocks float until other blocks push them under the surface. As soon as the program recognizes a formed word, it disappears, and you score points, based on the length and difficulty of the word. If you manage to form a "magic" word, the whole well is emptied. An "eraser" block falling randomly lets you zap a letter that may be particularly out of place. Letters with a question mark are "wild cards" that become any letter you type before they hit bottom.

Wordtris has a sixty-thousand-word dictionary and very fast recognition algorithms. Performance was very good on a 12MHz 286. You can even add one thousand words of your own to the dictionary.

Since this is a fairly difficult game, there is a "children's mode" that makes the letters fall
very
very
slowly. There is also a
sneak preview option that shows you the next letter that will fall.

I recommend setting the minimum word length to four letters—it's annoying to have the program constantly removing obscure three-letter words when you are trying to build something more impressive.

The package contains a 26-page manual, two 720K and three 360K disks. Some

Continued

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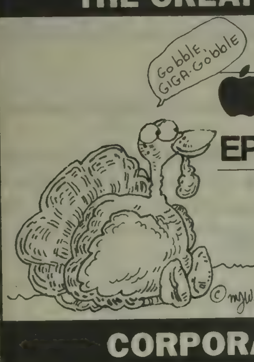

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very poorly written on-screen installer instructions might confuse a beginner, but the game's options and controls are easy to use. You need to use the manual to identify a quotation before the game will run.

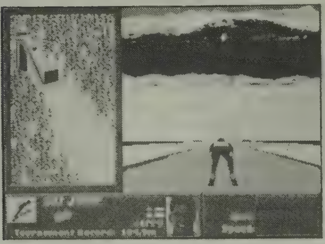
With two computers and two copies of the game, you can play against an opponent over a serial cable, modem link, or Novell network (!).

Wordtris is a well-crafted game that should appeal to gamers who enjoyed its predecessors, Tetris, Welltris, and Faces, and to those who love crossword puzzles, Scrabble, and similar word games.

THE GAMES: WINTER CHALLENGE

Designed By: Jeff Sember and Mike Benna
Published By: Accolade
For: IBM PC and compatibles (640K, VGA or EGA graphics, 10MHz or faster 286 CPU recommended, supports AdLib, Sound Blaster, Roland MT-32 and LAPC-1 audio cards). Sega Genesis version coming in Spring 1992
List Price: $54.95

The name and logo of the Olympic Games are trademarks jealously protected by the greedy Eurotrash who control the International Olympic Committee. No software company can afford the IOC's licensing fees, so we will probably never see an official Olympic computer game. Accolade's new simulation of the Winter Olympics is simply called The Games: Winter Challenge. It offers impressive animation and sound effects for the bobsled, luge, cross-country skiing, speed skating, the ski jump, giant slalom, downhill ski race, and biathlon.



The package includes an illustrated 40-page manual, a quick reference card, a cardboard code wheel, and one 5.25" high-density disk. The 3.5" disks can be special-ordered for an additional $5.00, and for $10 Accolade will exchange the program disk for a set of 5.25" 360K floppies.

The program's installation can be customized in several ways. A Fast Load option takes twice as much hard disk space, but gets the program up and running faster. With Fast Load selected, the VGA version takes up 1.4MB. On slower CPU's you can opt for a lower level of graphic detail to speed up the action. Winter Challenge can be run from Windows 3.0 if you have at least 513K of application memory free, and the program comes with a nice Windows icon for the Program Manager.

Your digital athletes can be controlled with a joystick or the numeric keypad. The simplest controls are for the luge: Start, Steer Left, and Steer Right. The most complex event is probably the biathlon, which combines target shooting with cross-country skiing.

The screen is divided into three panels—an overhead map view of the course, a status bar across the bottom, and a spectacular animation window as seen from the perspective of the athlete. The graphics are a slick combination of polygon-fill objects and bit-map backgrounds.

The mouse can be used only for selecting game options. There is a training mode for practice, and a tournament mode for multiplayer competition. There is even an Instant Replay function, so you can relive Great Moments.

The Games: Winter Challenge has enough variety to provide many hours of entertainment. I liked it, and I hate snow. ■

Continued from page 122

released a forecast saying that in 1995, pentops would be the largest share of unit shipments next to desktops, and would outsell notebook computers which are keyboard-only by a factor of two to one.

What did he base that on?

His own research into the requirements of the marketplace. He's one data point, and there are more; but according to him, these machines will outsell notebooks two to one and penpads by three to one in 1995.

Say I'm a professional looking at notebook computers. Why should I go for yours rather than, say, Compaq's?

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The second reason is that if I have a keyboard notebook computer, I'm limited to using that computer, basically, when I'm by myself, because I can't use a keyboard when I'm talking on the phone or when I'm in a meeting or when I'm interacting with other people, because the keyboard is an intrusive device and socially unacceptable.

With our machine, you can carry your information set with you wherever you go, by virtue of its portability, and you can have access to it anytime you want by virtue of the pen interface. If I've got a spreadsheet on my desktop computer and I'm in a budget meeting and somebody says to me, "What happens to the budget if I want you to do this?" I can do the what-if right there. It's not because the notebook computer with a keyboard can't do it right there either, it's just because nobody will allow you to do it because you're sitting there [*pounds on table*] doing that.

Why would you buy a notebook that you can use one-fifth the amount of time during the work day?

A lot of people, too, in the white-collar horizontal market use fax as a mechanism for communication a lot. And fax with a pen computer is much more convenient than fax on a notebook computer, because you can mark right on the fax electronically and send it back without ever having touched paper or pencil.

Harvard just released a study that said between 1962 and 1988 investments in information technology for white-collar productivity enhancement grew by a factor of ten. They also mentioned white-collar productivity increases, and they found that over that period of time, white-collar productivity grew by a startling 5%. So in twenty years, ten times more investment in information technology, and 5% increase in white-collar productivity. That seems a little weird.

Somebody with the checkbook is going to start asking nasty questions.

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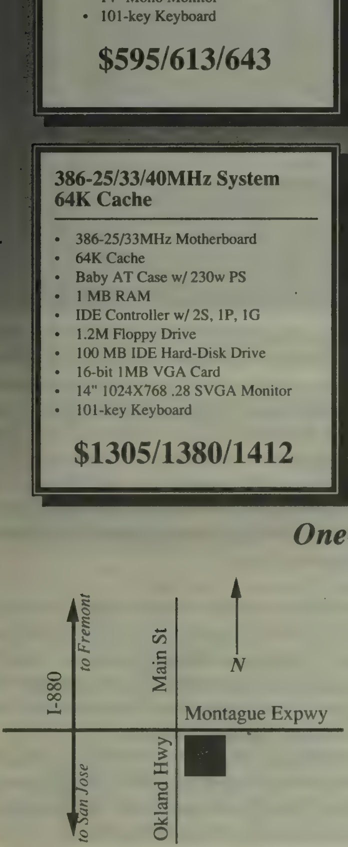

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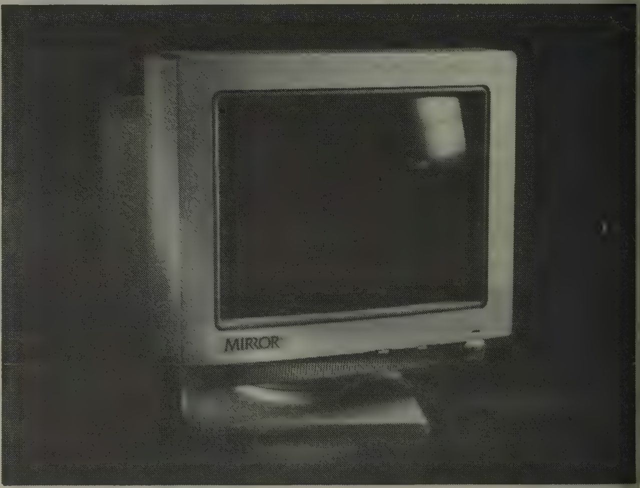
The Affordable Color-Mac Workstation

Just Because That Quadra's Out Of Your Reach, Multimedia Doesn't Have To Be...

BY TONY REVEAUX

The Mac still remains the favored platform for desktop publishing, graphics, music, and multimedia. To fully use this wide range of sophisticated applications, the first choice of professionals is usually a Macintosh IIfx or Quadra, with 8MB of RAM and a color display, 19" or larger.

Because of the easy-to-use consistency of the Mac graphic user interface, and the greater availability of entry- and intermediate-level programs, more and more Mac users want to be able to include graphics, DTP, and multimedia as part of their regular work. Few of them can justify the investment in the heavy-duty desktop hardware of the full-time professional.



CONFIGURATION STRATEGIES

For those of you who already have, or are planning to buy, a Mac LC, ci, IIx, IIcx, or IIsi, here is an approach to upgrading your box's graphics capability without winning the lottery. Adding a graphics accelerator card that supports a hardware-based Virtual Desktop, coupled with a low-cost 13" or 14" color monitor, can make the difference between a struggle and a streak in your publishing and presentation work.

There are different kinds of accelerator boards with different working goals. For overall performance, the ideal choice, of course, is a higher-level model of Mac—when you can afford it. Systems accelerator boards like the Radius Rocket and Fusion Data Systems' Tokomacs can lift off your 68030 system into the 68040 orbit of the Quadras. Adding a floating-point or math coprocessor chip or board will increase your number-crunching muscle. Apple offers a $3000 upgrade board for a Mac II or IIx that will reincarnate it into a IIfx. A comprehensive upgrade is like leap-frogging your Mac into the next machine generation. Today's Quadra will be tomorrow's Qlassic.

When your upgrade goal is the enhancement of graphics operations, your first decision will be to choose between an 8-bit or an 8/24-bit environment of resolution. There are many good 8-bit graphics accelerator boards available for under $600. If you add one of these components to a Mac LC, ci, or si—computers which already include on-board 8-bit video for small screens—you will be increasing their performance power. If you add an 8/24-bit board, you will be expanding the range of resolution as well as the performance.

For presentations and multimedia, most of your finished documents will usually end up being at 8 bits. Though 24-bit images can have a richer depth of detail and smoother resolution, they are more memory-intensive and their elements are slower to display, animate, and move. If your goal is electronic publishing, then you probably already know that you want to be able to work in 24 bits (and 32 bits, with software programs that employ the extra 8-bit alpha channel, which provides 256 levels of transparency). With 24 bits, you can take full advantage of the powers of programs such as Adobe Photoshop, Letraset ColorStudio and QuarkXPress, and perform photo retouching and color prepress layout.

But even for multimedia, a 24-bit environment can be an advantage. Many producers will create elements within a 24-bit program because they can exert much more control on detail and color, especially with elements that have been scanned in, like photos and sketches. Then they can downsize the 24-bit documents to 8 bits. The new document may retain much of the quality of the original one, even though coarsened in a lower resolution.

With the arrival of Apple's QuickTime, a new photo, animation, and video compression and playback utility due by next quarter, desktop video will become more common, and you may find yourself creating multimedia documents to be played in QuickTime. A 24-bit environment may be more flexible for that kind of work.

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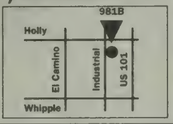

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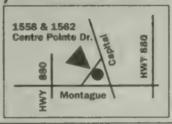

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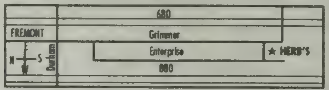

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REAL VIRTUALITY

There's another advantage to an 8/24-bit environment. It can give you an application-independent Virtual Desktop, providing the equivalent of a larger-area monitor. SuperMac's Spectrum/8%24 PDQ (about $1100 street), with its SuperVideo 2.2 software, has hardware-based pan and 2X zoom and can generate a workspace larger than the 1:1 size of the monitor. I have been using an 8%24 PDQ in a Macintosh IIcx with 8MB of RAM, with a Mirror 14" Color Display ($399 direct). The Mirror has a resolution of 640 x 480 pixels, the same as Apple's RGB 13" monitor ($750 street), a solid performer. The size of the Spectrum/8%24 PDQ's Virtual Desktop starts at the 1:1 size of 640 x 480 pixels, and can then be expanded in six steps: 832 x 624, 1024 x 768, 1024 x 1536, 2048 x 1536, and 4096 x 1536. These are proportional equivalencies to other display areas.

There is a tradeoff, though. The larger the area, the fewer colors or shades of gray you can employ. So, at the largest area of 4096 x 1536, you can only realize that full eight square feet of space in the 2-bit black-and-white mode. As in the zoom-in mode, you can move around the big desktop simply by panning or moving your cursor to the edge of the screen. Because of the powerful graphic acceleration of the 8%24 PDQ, it moves instantly, without a jerk, blur, or jitter. It is so easy to move back and forth between these different ratios of resolution and size that it's possible to manage large documents on a small monitor, using the larger screens for layout and the smaller ones for editing and detail.

A graphics accelerator board such as the 8%24 PDQ has custom ASICs (Application-Specific Integrated Circuits) that include a NuBus controller that moves data from the NuBus onto the graphics card as fast as possible. The NuBus is slow, and has remained a major bottleneck for the kinds of data that draw and redraw QuickDraw graphics primitives. Here, QuickDraw is accelerated at two different levels—at the high-level QuickDraw commands such as polygon movement and color specifications, and also at the low-level commands like bit-blits, the movement of one block of pixels from one place to another. The scrolling of text, and the scrolling and redrawing of a document such as a spreadsheet, happens in real time.

I find that with the board's acceleration on, even word processing activities have more snap, crackle, and pop. Working with Adobe Photoshop, 24-bit full-color images open faster and smoother—like a curtain dropping—and when I move the image around on the page, it holds it off-screen and then snaps fully open when the mouse button is released. Effects such as the special filters are much faster, many almost instantaneous. With applications like MacroMind Director 3.0, some functions respond better to acceleration than others, depending upon the program's internal routines for parceling out its "frames" of data, as determined by the document's continuity.

THE VALUE OF ACCELERATION

How important is the extra speed gained with an accelerator? Some actions will have an almost imperceptible speed increase, while others are dramatically quicker. But it's not the individual flash of pixels that's important so much as the cumulative savings of time accrued over the course of an operation, or in a project for processor-intensive applications such as DTP and graphics. Efficiency aside, perhaps the most important advantage in acceleration here is the more direct, real-time response to your actions that can help make your work a more intuitive experience.

When you're working in image-intensive areas such as graphics and DTP, you should try to get the largest color monitor you can afford. Many color monitors of 21" and above have resolutions of 72dpi (dots per inch) or even 80dpi for some grayscale full-page displays. It helps to be able to see the entire document at once when you're designing and editing projects. With complex applications like QuarkXPress and MacroMind Director, a large screen allows you to place and display all the different palettes at once without having to stack them.

That said, it simply may not be possible for you to afford one of these monitors when some tubes can cost as much as a used Buick. Prices are coming down, as with many other computer components. I've seen SuperMac 19" SuperMatch displays with prices lowered to as little as $2000, and 21" SuperMatches for $2400. That still may understandably be too high a tab for your current workstation resources. That's why a small color monitor and a graphics accelerator board may be a viable strategy for you at this time. You may be able to add a larger display further on down the road.

I have found this Mirror 14" more than adequate. When pushed into the 32-bit mode by the SuperMac accelerator, pixel-by-pixel editing in Photoshop was not noticeably hampered, any more than it was when I've used a 21" SuperMatch or a Mirror ProView 20. There are many ways you can plan your acquisition strategies to build a wizard of a Macintosh graphics workstation, depending upon the components you already have and those you can afford to get. ■

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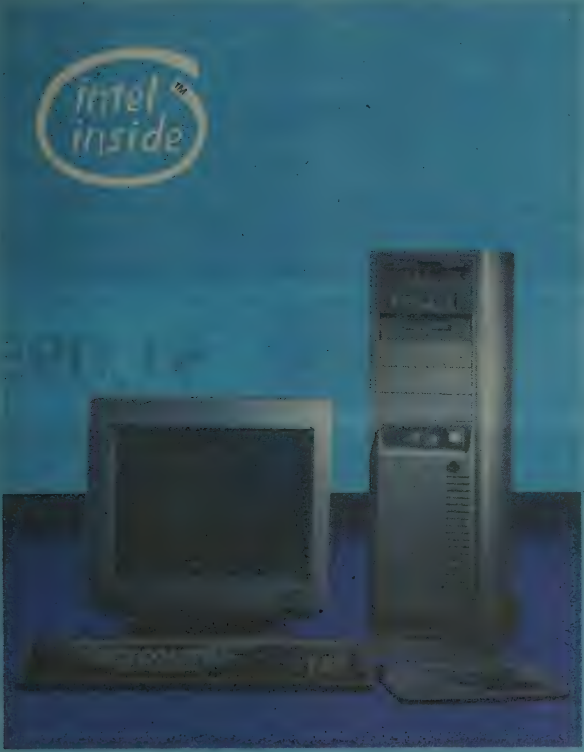

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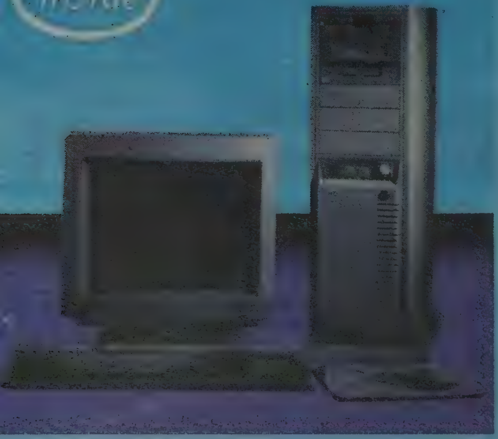

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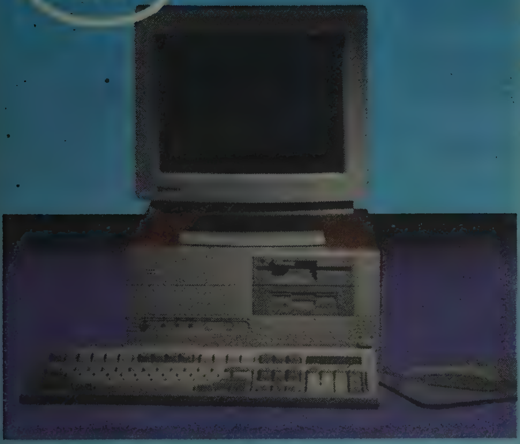

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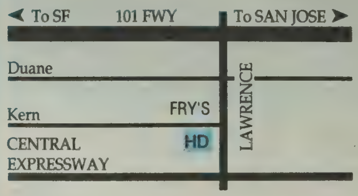

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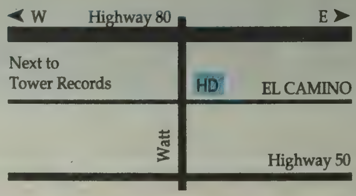

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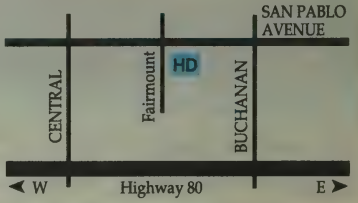

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The Month Of Living Dangerously

Trade Shows, Firestorms, And Holiday Hits

BY DAVID MORGENSTERN

BMUG

What a month! Berkeley almost burns to the ground, new flavors of Macintosh hit the street, and my shoes need a resole job from marathon trade shows. And now come the holidays—I'm holi-dazzled!

I was profoundly disappointed in the lack of respect for traditional observance at the Halloween eve BMUG meeting. Out of the 230+ attendees, only two wore costumes—Tim Holmes, a BMUG staffer, dressed as a marketing representative-vampire, and I, outfitted in a monks robe, a B-Monker. Apple came that night, showing off their new products, and wore excellent costumes to boot.

Apple has always honored the Halloween holiday. Their festivities begin with a traditional Halloween parade around downtown Cupertino. Hundreds of employees walk around the Apple campus dressed as peculiar personages.

Fortunately, the weather was warm, and everyone was pleased with the costumes. One woman came as Clarus, the DogCow, with strategically placed udders. The "Farmer Jones Catholic School Girls" were an entire department sporting plaid dresses and pony tails. Are these the new Mac models?

SHOW STOPPERS

The Seybold Computer Publishing Expo was held in San Jose this year. It's an intriguing show, with products from $25 to $250,000—no kidding! There were products for every flavor of micro- and mini-computer, top-of-the-line printers, and the annoying living-theater of Renaissance Faire refugees advertising Gutenberg's Garage, a series of hands-on demonstrations.

Seybold is a show for publishing veterans, not for the hobbyist. The software and hardware is complex and expensive. As the power of desktop systems has improved, stodgy established publishing system companies have started to migrate products down the CPU chain. The cost of a high-quality, entry-level "solution" in this market may seem astronomical to the user on the street, but to the experienced professional it's a bargain.

In the past couple of years, Seybold has moved from a traditional computer-to-print emphasis, to encompass multimedia, desktop video, and electronic publishing systems. This year's theme, "The Evolving Process of Communication," is just another way of saying, "If I'd only waited a year to buy, I'd have saved a bundle!"

It was no surprise to see the big Apple, IBM, Silicon Graphics, NeXT, and DEC booths mixed among the type foundries, and other desktop publishing software vendors. There were several systems from Europe based on '030 Atari CPUs. The Xerox booth was immense, and provided sixty-four seats for people to sit down. Unfortunately, the price of the breather was a lengthy indoctrination session in the company's technology offerings. I just wanted to rest, not sleep.

Robert Lettieri, one of BMUG's video gurus, gave me a guided tour of desktop video products on the show floor. He's been hard at work on a wild new BMUG product, a CD-ROM filled with public domain QuickTime video clips. QuickTime is the new (to be released in late November) Apple multimedia standard that will let users cut, paste, and play digitized video and audio on their Macs.

Here are a few of the coolest things we saw:

•Kodak and Sony were showing true digital cameras. These cameras should not be confused with the popular analog/video-based products, like the Canon XapShot, or Sony Mavica. Their resolution is limited, but they're reasonably priced. The totally digital camera is a horse of a different color—money green. The pictures are superb, and the price is equally lofty.

The digital cameras use three little CCD arrays to capture an image. Where still video produces images consisting of 250,000 to 500,000 pixels, their totally digital cousins generate images composed of 1.3 million pixels! The 18MB datafiles created won't fit on the little 2" floppies used in the lower-resolution cameras.

As you might expect, the cameras look like run-of-the-mill models, but have a data cable stuck on the back. The Kodak system is based on the Nikon F3 camera. The cable leads to a

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portable hard disk that stores the images. Users can attach a monitor and check out the shots on the spot. Both companies are pushing the systems to photojournalists, but are looking at other markets, in medical, police surveillance, and catalog photography. We're talking $20K and up for these gadgets, so don't expect to see them in the Sharper Image catalog this holiday season.

When you see the output of these systems on a high-end printer, like the Kodak XL7700, you'll think you're looking at chemical-based photography. It only takes a few minutes for this continuous tone dye transfer printer to spit out an 8.5 by 11 copy. Seeing is believing with this technology.

Kodak also showed their Photo CD system. In Spring '92, when you take a roll of film in to be developed you can get the pictures on a CD-ROM for an extra $20. The negatives are scanned and stored on a compact disc. The software creates different resolution images for use in desktop presentations, DTP, or projection on your home television set. The CD is compatible with the new Phillips consumer info-tainment CD-I machine.

•I was impressed with the Video Spigot Pro for the Macintosh IIsi, the low end of the Mac II family. It combines a digital-video frame grabber and a 24-bit color accelerator into one card. The card lets you hook up a VCR or video camera to your Mac, and capture the action onto your hard disk. Since the Spigot is also a display card, you can see what you're getting in 24-bit color on the smaller screens, or 8-bit color on larger screens. There's even room on the card for a floating-point math unit if you want to crunch a spreadsheet.

Ironically, this product is not available in such a glorious fashion for some higher-flavored models. The Spigot Pro is crammed into the Processor Direct Slot (PDS) on the IIsi, which allows it enough room to speedily move the enormous amounts of data required for video and audio. This slot doesn't exist on the more "superior" Mac IIcx and IIci. You'll have to decide if you can afford to let the three-cards-in-one Spigot tap into your wallet—it lists for $1899.

•The groovy Silicon Sports guys were showing the fall line of wrist pads. The new "mood" pads will definitely be *the thing* this year. They're the perfect physical desktop mirror of the progress you're making on the virtual front.

FIRESTORMY WEATHER

The tragedy of the East Bay Firestorm touched many lives, including BMUG members. Although we didn't lose anyone, a number of members and key volunteers lost their homes, possessions, and computers.

Although BMUG members were calling

UPCOMING EVENTS:

December 5	Now Software *Now Utilities 3.0*, MYCAM Software (CAD/CAM design and manufacturing software).
December 12	Finals—Meeting Canceled.
December 19	Prodigy Online service, Alysis *Superdisk*.
December 26	No meeting due to Holiday.
December 30	BMUG West at Exploratorium museum in San Francisco. No meeting due to Holiday.

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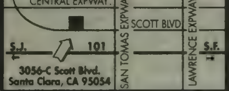

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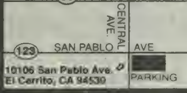

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We often think we're ready for any data emergency. The utility programs are on the hard drive and floppies, waiting for a failure. Everything is backed up, daring the digital gremlins to do their worst. But most users are not prepared for the worst and most primitive of data disasters—fire.

the office to volunteer their data-entry services the day after the fire, the Red Cross didn't really need our volunteer assistance. This was a much different situation than we encountered after the earthquake a couple of years ago. But the extended BMUG network will find a way.

After discussions at the weekly BMUG meeting, and on the bulletin board service, the word filtered down the Bay to Anne McMullin at Apple's Community Affairs department. She contacted Raines Cohen, BMUG board member, who established a link to the Oakland Office of Public Works.

Apple donated a store full of Mac Portables for field inspectors to monitor demolition and reconstruction efforts. Raines said that Don Storia, the Contract Compliance Officer at OOPW, was ready to go with a freshly optimized FileMaker Pro database. Raines has the most BMUG experience with the Portable—he survived it, and it survived him, around the world, on bicycle trips, and the triple hazard of his bachelor pad's mess.

We often think we're ready for any data emergency. The utility programs are on the hard drive and floppies, waiting for a failure. Everything is backed up, daring the digital gremlins to do their worst. But most users are not prepared for the worst, and most primitive of data disasters—fire.

As residents of the Oakland Hills discovered, years of data and reports can become blackened clumps of trash in minutes. It's hard for all users, at home or in the office, to understand that it's the data that's important, not the expensive boxes that give us access to the marvels of software engineering. Protecting data is not easy.

Many safe manufacturers have special models to protect data. They are quite different from safes designed to guard paper. Paper burns at 375° F. Media safes are rated around 150° F/one hour of fire for large tape data, and 125° F for cassettes. These safes would work for floppy media as well.

There are several models that look like two-drawer filing cabinets. Data safes are more expensive than "fireproof," but don't scrimp and buy any old used safe. Old money safes are worthless for protecting data—they're worthless for protecting money, too. They're meant to keep greedy fingers away from the dough, not fire.

I spoke to Ken Dunckel, a local professional safecracker, about the problem. He

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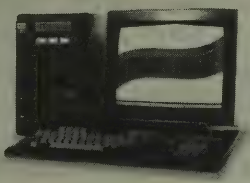

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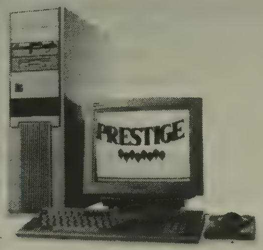

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said that small numbers of disks can be protected by putting them in a small, fire-resistant media container, and placing that in a regular paper safe. He stressed that "80% of businesses that lose their records in a fire never reopen."

Another important principle of data disaster security is the concept of off-site backups. This requires placing copies of important data, business records, and even photographs, in another location. BMUG practices what it preaches, and our off-site storage of our business records and membership database missed the fire by a block. But the principle held—unless all of Berkeley had burned, we would have had a copy somewhere. You get the idea, right?

A quick and easy way to get an off-site backup is with snail mail. Characters in mystery stories do this all the time. Put a floppy in an envelope, and mail it to yourself. Depending on the day of the week, and the quality of delivery, you're safe for—who knows? The new super-high-density 20MB floptical drives available this winter will make this plan even more effective and easy.

Keeping track of what you own is an important consideration for disaster planning. Nolo Press makes For the Record: The Family Record Organizer, that catalogs all your important legal, financial, personal, and family records. It doesn't just provide simple database functions, but calculates net worth and liabilities. The manual has tips on estate planning. Be sure to store a digital and paper printout of the inventory in an off-site safe place.

THE HIT PARADE

It's the giving time of year again, and that means presents. Please call the BMUG office (510/549-BMUG) to get the latest news on holiday gift bargains. We've added a new easy way for getting your order processed—just dial 1-800-776-BMUG for credit card orders over $30. Here are a few heavy hints in the BMUG gift department:

•*The BMUG Guide to Bulletins and Beyond* by our resident telecommunicator, Bernard Aboba, is our latest publication. It's a user friendly way to inform yourself about going online. It's $12 and comes with a disk.

•To warm up for the next Macworld Expo, buy our latest video tape, The Boston QuickTour. It's a mix of personalities and programs by an exceptional volunteer, Janet Sky. BMUG videos are $15.

•There's a slew of new disk packs of all sizes for the holidays. They're filled with the latest and greatest fonts, utilities, and games. Our two-disk set of holiday clip art is a bargain for $6. Get our holiday flyer for all the details.

•The BMUG tie-dyed T-shirt is still the only shirt to be seen in. It reads "The BMUG T-shirt. Tie dyed in Berkeley by Deadheads." You're guaranteed a fit, with our one-size-fits-all sizing. $12.

•The BMUG tote bag is the environmental class act at meetings, shows, or the supermarket. $10.

•BMUG membership is not something that sits on your hard disk, that you launch once in a blue moon. It works for you every day, out in the computer world, educating people, pushing vendors to do the right thing, and helping users. Members receive the fantastic *BMUG Newsletter* (a 350+ page book with no advertising), access to our 16-line bulletin board service, and telephone HelpLine. The cost is $25 for six months, and $40 a year.

BMUG relies on the generosity of our members. Their membership, volunteerism, and spirit help keep BMUG strong and independent. If you're able to give extra this year, please keep us in mind. We can use cash donations, software, or hardware—or if we can't use them we'll try to find someone who will.

Everyone at BMUG wishes you a year of peace and prosperity. May your hard disk spin freely, and your data be error-free. Happy Holidays and New Year! ■

What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide.

Like any growing organization, it is many different things to its eleven thousand international members. BMUG supports many Special Interest Groups (SIGs), a Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6–9 (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG office, 2055 Center Street (a half block from the BART station) is open to the public 9 am–5 pm. Please come by and say hello, meet other members, and hang out.

The BMUG HelpLine, (510)540-1742, and our fax number, (510)849-9026, provide technical assistance and telephonic hand-holding during business hours (11 am–5 pm). If your question can't be answered on the spot, we try to get you in touch with someone who can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around with 700+ double-sided disks filled with the latest versions of public domain or shareware programs and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the *PD ROM™ Version II*, our library and more on CD-ROM.

Our sixteen-line BBS offers many of the latest versions of files in our software library as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you would be able to get in touch with us wherever you are, as well as send mail to users everywhere! BMUG is a part of the international USENET network (ucbvax!garnet!bmug) or (user.name.bmug@garnet.berkeley.edu). With our sixteen-line capability you are now able to have access to BMUG almost twenty-four hours a day. It's easy to use, fun, and a great resource.

To get some further information about BMUG please write to: BMUG, 1442A Walnut Street #62, Berkeley, CA 94709. If you prefer to phone our business office call (510)549-BMUG, or fax (510)849-9026.

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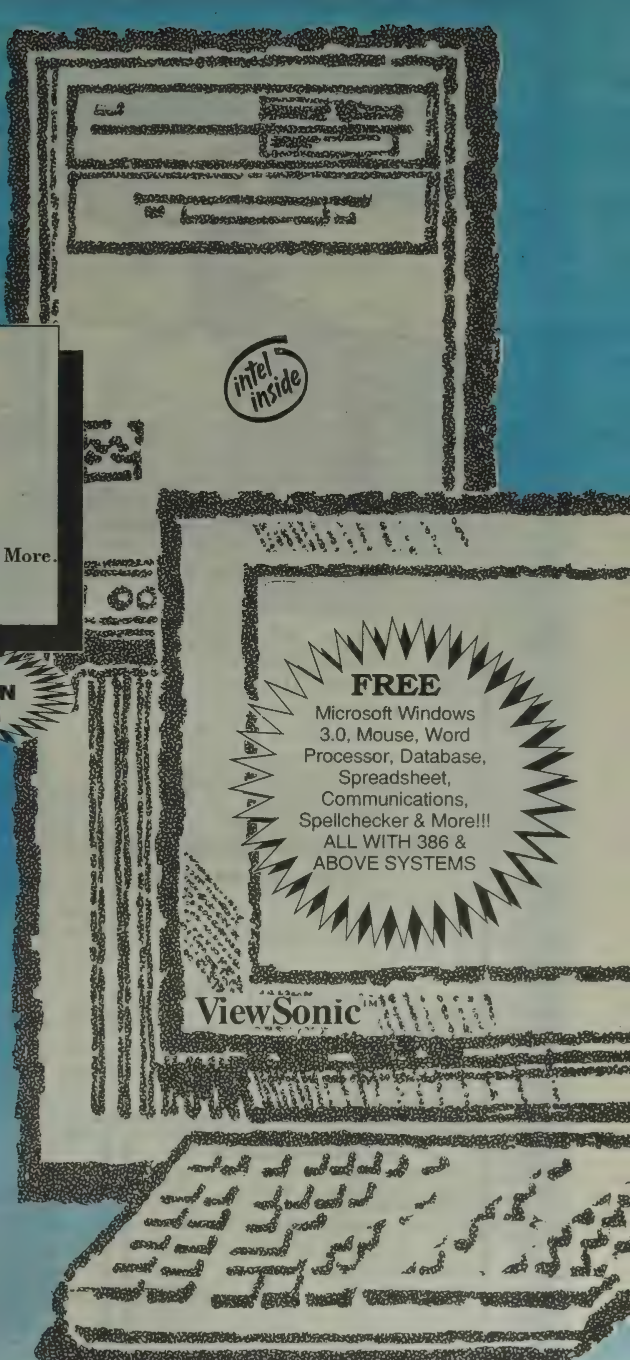

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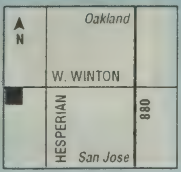

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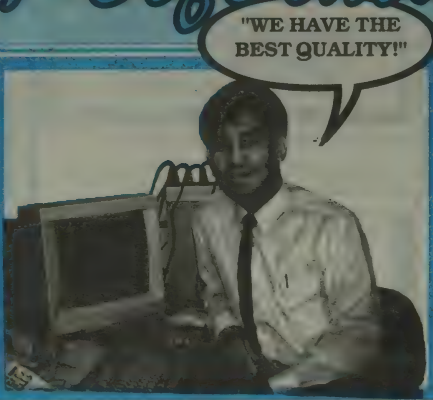
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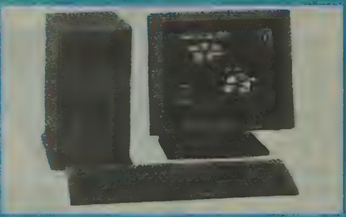

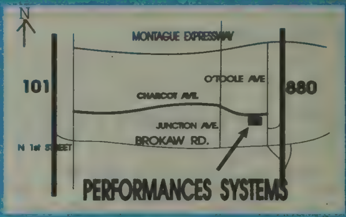

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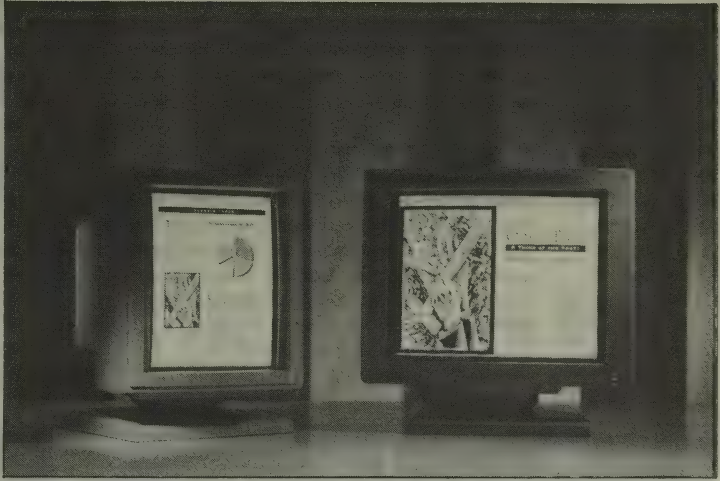
The Mobius 030 Display System Provides An Integrated Solution For Keeping Your Mac SE A Powerful Desktop Tool

BY MICHAEL ROBIN



From the Control Panel you can determine on which screen the menu bar and disk icons will appear, and set where the two displays are in relation to each

A new generation of users were discovering desktop publishing (DTP) around the time Apple introduced the Macintosh SE. This combination—the SE and DTP—was a big step for many, simplifying the layout process, saving time and money, and introducing many of us to the ease-of-use and possibilities of Macintosh desktop computing.

The compact Macs, particularly the SE, have truly been work horses in the Macintosh community. But one problem in using the SE for desktop publishing and graphics design has been its small, built-in 9" screen and slow speed. It quickly becomes time consuming and tedious scrolling around to view sections of a page. Also, when you select "fit in window" in PageMaker to see the full page, you can't read any of your text.

The common solution to the screen limitations of the SE has been to attach an external full-page display. The main drawback to this solution, however, is almost always its slow speed. It has always struck me as odd that almost none of the external displays designed for the smaller Macs include an accelerator card. Plus it's difficult to find an accelerator card that not only works with another manufacturer's video card but fits with it into the single expansion slot inside an SE. The 8MHz of a standard SE all by itself can be frustrating enough when working with page layout or graphic-intensive applications. The time it takes to perform new functions or redraw a change is even slower when that same Mac must also drive an external monitor.

The Mobius 030 Display System combines a high-quality full- or two-page display and a 25MHz, 030 accelerator board with built-in video support. It offers a way to make your older Mac SE, as well as the new Classic, a powerful tool for desktop publishing as well as other tasks.

THE MONITOR

The Mobius One Page monochrome display has a sharp, bright screen with a resolution of 640 x 870, the same as the Apple Portrait Display. (The Two Page Display supports 1024 x 826 resolution.) The contrast and brightness controls, along with the power switch, are easily accessible.

Mobius's dual-screen software lets both the large monitor and the Mac's built-in display be used simultaneously. Working between both monitors, it is easy to compare them. Although I preferred the darker contrast on the Mac, other people I worked with felt the Mobius was easier to read. Most full-page and larger monitors have difficulties with images looking as though they are warped at the extreme edges of the screen. However, the Mobius was as sharp and straight as the majority of monitors I've seen, even ones costing twice the amount.

Mobius has consistently demonstrated a concern for user health from the threat of the monitor's low-level radiation. Mobius claims that their displays have always met Swedish MPR standards for VLF, or very low frequency, magnetic fields. They also include a special concealing coil, which generates a countering interference pattern, to lower measurable ELF, or extremely low frequency, radiation.

THE ACCELERATOR

The Mobius accelerator card controls an 030 accelerator and the display. Its 25MHz more than triples the 8MHz of the SE, putting it neck-to-neck with the IIci. You have two choices for the Mobius accelerator. The standard system features the Motorola 68EC030 processor. This is fully functional, but does not work with the PMMU (paged memory management unit). The optional upgrade consists of the more familiar 68030 with the PMMU.

Although the Mobius system and the Mac SE and Classic are System 7 compatible, these Macs don't support virtual memory in their native state. Connectix Corp.'s Virtual 3.0 software can be used with this 030 system to give the Mac access to up to 16MB of application memory—or four times the memory usually accessible on the SE or Classic. However, to do this you must have the upgraded 68030 system.

RESOURCES:

Mobius Technologies, Inc.
5835 Doyle St.
Emeryville, CA 94608
(510)654-0556

There are four SIMM sockets on the Mobius where you can move your RAM—you will have space for 1 to 16MB (four 4MB SIMMs) of RAM. However, after moving the RAM, you must reinstall at least two of the original 256K SIMMs onto the Mac logic board, otherwise your machine will not boot-up.

To overcome the difficulties of upgrading the Classic, which does not have an expansion slot, Mobius has designed the accelerator and video driver boards to clip directly onto the sides of the main processor board, using a special set of snap-on connectors. The 030 system for the Classic also includes an 8W, auto switching power supply.

AT WORK WITH A MOBIUS

Working with the Mobius Full Page 030 System reminded me how good it felt when I got my new Mac SE. As soon as you begin working, launching an application, the increased performance with the Mobius is instantly apparent. Whether you are spell checking, performing a find-and-replace, or sorting your database, everything goes quicker. PageMaker, particularly v4, is not known as a fast program. But on a standard SE, it is downright slow; waiting for documents to be imported for layout, waiting for the text to flow in, waiting for everything to redraw when you add a word or change the view size. With Mobius 030 Display System you can more fully concentrate on your work, working at a pace you set, rather than working only as fast as the computer will let you.

There was one compatibility problem, however, between PageMaker and Mobius. At 200%, the guidelines disappeared on the Mobius monitor. Mobius support was helpful, offering me a solution and telling me that the software conflict will be resolved in the next upgrade. They suggested going into the Mac Control Panel and switching the position of Mobius from the right to the left side of the Mac, but not actually moving anything on my desk. This solved the problem. The only drawback from having the software think my SE is somewhere else is when I move the cursor from the Mobius to the Mac. I now must drag it to the left to have it appear to the right.

The only other conflict I noticed was that the Mobius board also accelerates the Mac sounds, distorting the beeps, clanks, etc. There is no solution for this other than buying a new Mac with ROM that runs faster. Rather, the best thing to do is choose the sound that is least distorted to your ears.

With Mobius 030 Display System you can more fully concentrate on your work, working at a pace you set, rather than working only as fast as the computer will let you.

There is no doubt in my mind that using a full- or two-page display is how page layout should be done. Likewise, it is both a joy and more efficient to work with layout and other more intensive applications on an SE with the increased power. You will no longer be eyeing your friend's or co-worker's SE/30 or Mac IIci. Mobius adds new life and power to your reliable compact Mac, whether it's an older Mac SE or a new Classic. ■

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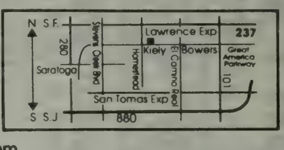

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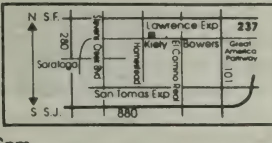

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AmiEXPO And Other News

True Color And More

BY MATTHEW LEEDS

AMIGA

It's been almost two years since I've been to an Amiga show, since my changing work responsibilities have kept me from traveling to shows outside of the northern California area. AmiExpo finally came to Oakland in October, and I took full advantage.

While AmiExpo shows are still small, this one made up in quality what it lacked in size. I saw a remarkable number of new, innovative, interesting, and creative products for the Amiga. The Amiga may not have as many machines out there as other platforms, but the programmers and hardware engineers who create products for it are among the best in the business.

AMIEXPO

I hadn't made it through the door before I was approached by Richard Lucas, who publishes the Vidia Guides. These are essentially cheat sheets for Professional Page, PageStream, graphics programs, the CLI, and a programmer's quick reference. Each is full-page sized, professionally printed, and contains condensed information applicable to each program or environment. The information contained in them is useful, but the guides are pricey. For example, the Fast Guide to Amiga CLI (twelve pages) is nine bucks, about a third of the cost of the AmigaDOS 2 Companion (four hundred pages) from IDG Books.

Once inside the door, I got my first look at Pixel 3-D 2.0 from Axiom Software. This is a 3-D object utility that converts bitmapped images to 3-D file formats. It supports Lightwave 3D, Imagine, 3D Professional, Sculpt 3D, Turbo Silver, Videoscape 3D, and DXF-AutoCAD formats. It also converts between each of these formats. While changing bitmaps or converting other format files, you can also bevel the image, change colors, spin the image about its axis, and choose the straight line algorithm used. You may also quick-render the object to view it in either wire-frame, solid, shaded, or color. You can also reduce the amount of memory required to render an object by removing redundant points and polygons. From the demo I saw, the program was reasonably fast and easy to use.

Also aimed at the 3-D market was Texture City, with a library of true-color 24-bit images. The images are patterns to be used in 3-D rendering packages as texture maps. All images have been processed in full 24-bit color depth. Each image is in severe overscan, tested with a waveform monitor and vectorscope to ensure video safe colors, and available in several formats: 24-bit IFF, DCTV, or HAM. Several different packages are available, all currently on floppy disk, compressed using QuarterBack.

The true-color market for the Amiga is just starting to heat up. While products like DCTV and HAM-E have been available for a while, new display cards for the 2000/3000 machines are showing up in quantity. Digital Micronics showed the DMI Resolver, an 8-bit card with a 24-bit palette. This card supports a display up to 1280 x 1024, and is most likely to be used for CAD, illustration, desktop publishing, and presentation graphics work. Companies currently working to support the Resolver with their software include ASDG (ADPRO), Oxxi (Presentation Master), Ditek (DynaCADD), Octree (Calagari), Natural Graphics (Scenery Animator), AdSpec (Draw 4D Pro), and Progressive Peripherals (3D Pro).

PP&S was also showing a new display card for the Amiga. The Rambrandt supports display resolutions up to 1024 x 1024, and includes a video frame grabber and an alpha channel. The main display is 24-bit, with the 8-bit alpha channel for overlays. The Rambrandt uses the TI34020 chip running at 40MHz, a very powerful graphics chip that allows for real-time effects. The alpha channel can be used to display menus and tools, leaving the 24-bit image unaffected. Also shown by PP&S was their new memory expansion card for the 3000. This card can hold up to 64MB of 32-bit RAM, either page mode or static column. It has four banks of four SIMM sockets, allowing for many different configurations of memory. In addition, PP&S showed two new 68040 cards for the 2000 and 3000.

CSA also showed a new 68040 card for the 2000. The 40/4 Magnum is more than just a coprocessor card, it's a full computer. In addition to the 68040 processor, it contains 1MB of static RAM, room for up to 64MB of 32-bit RAM in SIMMs modules, a SCSI controller, parallel port for digitizing, printing, or scanning, two serial ports (one RS-232, one RS-422), its own expansion bus, and room to mount a 3.5" hard drive on the board. CSA is positioning this as a Toaster accelerator and has no plans to release a 3000 version. They do intend to provide AppleTalk support for the RS-422 port, although I suspect that it will be more useful as a device control port for single-frame VTRs.

Great Valley Products showed their 68040 accelerator, the G-Force 040; it's designed for the 3000, and runs at 28MHz. It has room for up to 8MB of high-speed 40ns, 32-bit RAM, and the Kickstart ROM can be

Copyright © 1991. All rights reserved. Matthew Leeds has been involved in the high-tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.

Sony has announced the EVO-9650, a single-frame capable Hi8 VTR. This is the first Hi8 deck that can be used to render single-frame animations. Priced around $6000, it's still not a casual investment, but it does finally bring single-frame support to the Hi8 environment.

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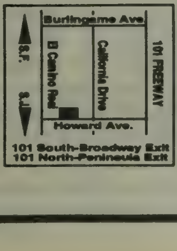
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copied to it. They also showed the Impact Vision 24, a 24-bit display card that provides a double-buffered 12-bit mode for animation, support for NTSC or PAL, real-time RGB frame grabber, picture-in-picture display, NTSC or PAL output, genlock, and overlay. Bundled software includes Macro Paint IV-24, Caligari IV-24, and Scala IV-24, all 24-bit versions of these popular programs. They also previewed their entry into the audio market with Sound Zone, an 8-bit audio digitizer with software.

Digital Processing Systems had the new version of the time base corrector on a card, the Personal TBC II. They have added a software controlled Processing Amp, Timing control, and Color Balance control. These let you compensate for timing, chroma, and phase problems.

Oxxi had more new products than I could keep track of. They were particularly proud of two: Visionary, their interactive gaming language, and Presentation Master, a presentation authoring environment. Visionary was created specifically for the creation of text, sound, and graphic animated adventure games. If you've ever wanted to create your own adventure games, Oxxi believes this is the product for you. Presentation Master imports both bitmapped and EPS images, includes object-oriented paint and graphing modules, creates hot-spot buttons to branch presentations, and supports color PostScript output to printers as well as screen-based presentations. While Oxxi was pushing these two new additions, I was intrigued by the fact that the Novell client software Oxxi had been developing under contract to Commodore will now be sold by Oxxi and not Commodore.

Gold Disk showed off the latest version of Pro Page, but I was more interested in their new video editing products. They seem to be the first Amiga software company that understands the importance of the changes happening in the consumer video market. The fact that products like ShowMaker, MediaShow, and VideoDirector are providing support for LANC (Sony's control L protocol), the NEC PC-VCR, and Selectra's VuPort control box (currently controlling the Panasonic 1960 S-VHS VCR) and VISCA (an expansion of LANC) shows that Gold Disk will be able to make a smooth transition into the video market.

IN OTHER NEWS

I've got three other pieces of information that were not available at AmiExpo, but are of importance to the Amiga community.

First, Sony has announced the EVO-9650, a single-frame capable Hi8 VTR. This is the first Hi8 deck that can be used to render single-frame animations. Priced around $6000, it's still not a casual investment, but it does finally bring single-frame support to the Hi8 environment. The salient points are that it supports VISCA and RS-232 control, offers read-only support for RC time code, uses industrial Hi8 time code (which is the same as 9700 and may have the same segment length restrictions), and has a slot for a slide-in encoder that can accept RGB signals at 15.75KHz and encode them to NTSC or Y/C (may offer PAL support). Sony is going to make certain that you can't use it in an A/B roll environment (note possible segment length problem). The 9650 is cheaper

Continued on page 238

RESOURCES:

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Texture City
3215 Overland Ave., #6167
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Digital Processing Systems
55 Nugget Ave., Unit 10
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Oxxi Inc.
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- AT Case + 200W P.S.
- IDE 1:1 2HD/2FD Controller
- Math Coprocessor Socket
- 101 Key Enhanced Keyboard

TCI 486-33MHz w/ Cache Landmark Speed Test: 152 MHz **$883**	**TCI 486-25MHz** w/ Cache Landmark Speed Test: 115 MHz **$823**
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TCI 386sx25MHz w/o Cache Landmark Speed Test: 31 MHz **$418**	**TCI 386sx16MHz** w/o Cache Landmark Speed Test: 20 MHz **$368**

TCI 486-33MHz
w/ Cache System

- Basic System Configuration
- 120MB IDE Hard Disk 18ms
- Super VGA Card w/ 512Kb
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$1,488

TCI 486-25MHz
w/ Cache System

- Basic System Configuration
- 120MB Hard Disk IDE 18ms
- Super VGA Card w/ 512Kb
- 14" SVGA Color Monitor (1024x768)

$1,448

TCI 386-40MHz
w/ 64K Cache System

- Basic System Configuration
- 120MB Hard Disk IDE 18ms
- Super VGA Card w/ 512Kb
- 14" SVGA Color Monitor (1024x768)

$1,188

TCI 386-33MHz
w/ 64K Cache System

- Basic System Configuration
- 120MB Hard Disk IDE 18ms
- Super VGA Card w/ 512Kb
- 14" SVGA Color Monitor (1024x768)

$1,168

TCI 386-25MHz
w/ 64K Cache System

- Basic System Configuration
- 80MB Hard Disk IDE 18ms
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TCI 386-25MHz
w/ 0K Cache System

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TCI 386sx 25MHz

- Basic System Configuration
- 40MB Hard Disk IDE 28ms
- Super VGA Card w/ 512Kb
- 14" SVGA Color Monitor (1024x768)

$853

TCI 386sx-20MHz

- Basic System Configuration
- 40MB Hard Disk IDE 28ms
- Super VGA Card w/ 512Kb
- 14" SVGA Color Monitor (1024x768)

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- Basic System Configuration
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MB 286-12MHz	$72
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MB 386sx16MHz	$165
MB 386sx20MHz	$194
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MB 386-25MHz w/ 64K Cache	$364
MB 386-33MHz w/ 64K Cache	$398
MB 386-40MHz w/ 64K Cache	$478
MB 486-25MHz w/ 8K Cache	$658
MB 486-25MHz w/ 64K Cache	$698
MB 486-33MHz w/ 64K Cache	$748
MB TCI-plus 386sx16MHz	**$265**
MB TCI-plus 386sx20MHz	**$310**
MB TCI-plus 386-25MHz w/ 64K Cache	**$560**
MB TCI-plus 386-33MHz w/ 64K Cache	**$625**
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14" Seiko 1440 Interlaced	$475
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Orchid Pro Designer IIs (w/ 32,768 Colors)	$Prices
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IDE DTK Controller	$49
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Modem 2400 Baud Rate External	$75
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Logitech First Mouse	$45
Logitech Mouseman (Serial or Bus)	$65/$75
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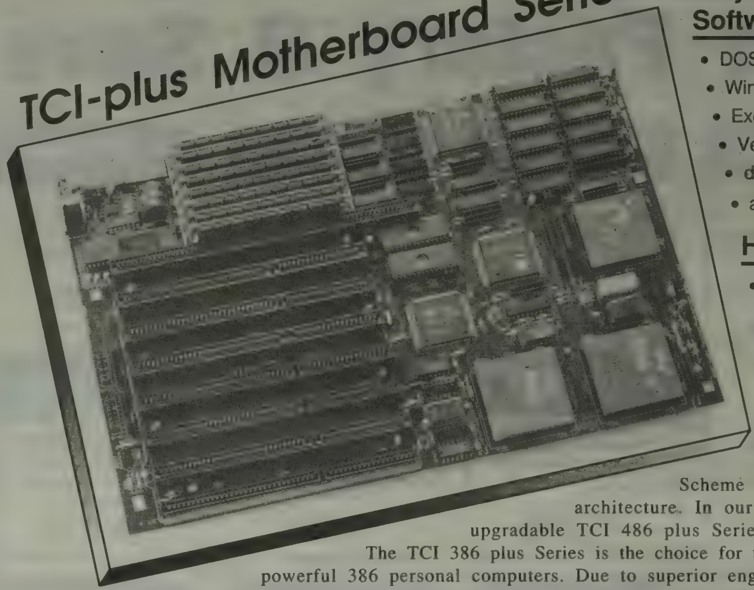

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** 386-40MHz ** 486-33MHz*

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- Intel™ 80486SX 20MHz microprocessor with built-in 8KB cache and MMU
- Upgradable to 80486 25MHz or 33MHz
- MaxiCache Architecture
- External, scalable 64K/256K direct-mapped cache
- Burst mode design
- Intelligent Refresh Optimized Scheme (IROS)
- RAM shadowing on Video BIOS
  System BIOS
  Disk controller BIOS
- Direct video BIOS caching
- Eight expansion slots
- Dual DMA speeds
- LIM 4.0 support
- Socket for Intel 80487SX or Weitek Numeric Coprocessor
- 32MB RAM capacity on-board, expandable to 64MB total system memory.
- Baby size (13"x8.5")

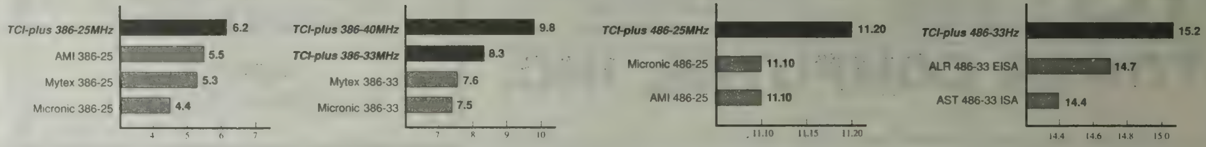
KEY FEATURES

- Intel™ or AMD™ 80386 40MHz/33MHz/25MHz microprocessor
- MaxiCache Architecture
- Intelligent Refresh Optimized Scheme (IROS)
- External, scalable 64K/256K direct-mapped write back cache
- System memory expandable tto 64MB
- RAM shadowing on Video BIOS
  System BIOS
- Eight expansion slots
- Dual DMA speeds (5/10 MHz for 40MHz, 4/8MHz for 33MHz, or 3/6MHz for 25MHz)
- LIM 4.0 support
- Socket for Intel 80487SX or Weitek Numeric Coprocessor
- 32MB RAM capacity on board, expandable to 64MB total system memory
- Support 256K x 9, 1Mb x 9 SIMM modules
- Baby size (13"x8.5")

KEY FEATURES

- Intel™ 80386SX 25MHz/20MHz microprocessor
- MaxiCache Architecture
- Advanced zero wait states, fast page mode design
- Two/Four way interleaving on memory
- Shadow RAM support in 16K increments
- 32MB RAM capacity on system board
- Built-in IDE floppy interface
- Built-in one paralled and two serial ports
- Socket for Intel 80387SX
- Eight expansion slots
- LIM 4.0 support
- 256K x 9, 1Mb x 9 and 4Mb x 9 SIMMs support
- Custom ASIC Design
- Baby size (13"x8.5")

Performance Test by MIPs



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Performance : 15.23 MIPS

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- 64K Cache RAM*
- 1Mb RAM Memory
- 1.2Mb Floppy Drives Teac
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- Club Rainbowl SVGA Card w/ 1Mb
- Club Monitor 1024x768 .28mm
- 1 Parallel, 2 Serial Ports
- 101 Key tactile Keyboard
- New MS-DOS 5.0 installed
- Tower Case available

Performance : 11.4 MIPS

$2195

TCI-plus 486sx20

- 80486sx™ 20 Processor
- 64K Cache RAM*
- 1Mb RAM Memory
- 1.2Mb Floppy Drives Teac
- 130Mb Hard Disk 15ms Maxtor
- Video Caching and Shadowing
- Club Rainbowl SVGA Card w/ 1Mb
- Club Monitor 1024x768 .28mm
- 1 Parallel, 2 Serial Ports
- 101 Key tactile Keyboard
- New MS-DOS 5.0 installed
- Tower Case available

Performance : 9.0 MIPS

$1995

TCI-plus 386/40

- 80386™ 40 Processor
- 64K Cache RAM*
- 1Mb RAM Memory
- 1.2Mb Floppy Drives Teac
- 130Mb Hard Disk 15ms Maxtor
- Video Caching and Shadowing
- Club Rainbowl SVGA Card w/ 1Mb
- Club Monitor 1024x768 .28mm
- 1 Parallel, 2 Serial Ports
- 101 Key tactile Keyboard
- New MS-DOS 5.0 installed
- Tower Case available

Performance : 9.8 MIPS

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TCI-plus 386/33

- 80386™ 33 Processor
- 64K Cache RAM*
- 1Mb RAM Memory
- 1.2Mb Floppy Drives Teac
- 130Mb Hard Disk 15ms Maxtor
- Video Caching and Shadowing
- Club Rainbowl SVGA Card w/ 1Mb
- Club Monitor 1024x768 .28mm
- 1 Parallel, 2 Serial Ports
- 101 Key tactile Keyboard
- New MS-DOS 5.0 installed
- Tower Case available

Performance : 8.3 MIPS

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TCI-plus 386/25

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- 64K Cache RAM*
- 1Mb RAM Memory
- 1.2Mb Floppy Drives Teac
- 80Mb Hard Disk 18ms Maxtor
- Video Caching and Shadowing
- Club Rainbowl SVGA Card w/ 1Mb
- Club Monitor 1024x768 .28mm
- 1 Parallel, 2 Serial Ports
- 101 Key tactile Keyboard
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Performance : 6.1 MIPS

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- 1Mb RAM Memory
- 1.2Mb Floppy Drives Teac
- 52Mb Hard Disk 17ms Quantum
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- Club Rainbowl SVGA Card w/ 1Mb
- Club Monitor 1024x768 .28mm
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Performance : 4.3 MIPS

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486-33	Zytex	64 k	1year	1595	1795
486-33	Pioneer	0k	2 year	1695	1895
486-25	Zytex	64 k	1 year	1549	1749
386-40	Beyond	64k	1 year	1295	1495
386-40	Pioneer	64k	2 year	1389	1589
386-33	Beyond	64 k	1 year	1259	1459
386-33	Pioneer	64k	2 year	1349	1549
386-25	Beyond	Page	1 year	1095	1295
386-25	Pioneer	64k	2 year	1179	1379
386-25sx	Pioneer	32k	2 year	995	1195
386-20sx	Beyond		1 year	985	1085
386-16sx	Beyond		1 year	775	975
286-16	Beyond		1 year	595	795
286-16	beyond		1 year	575	775

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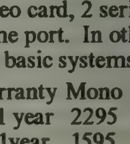

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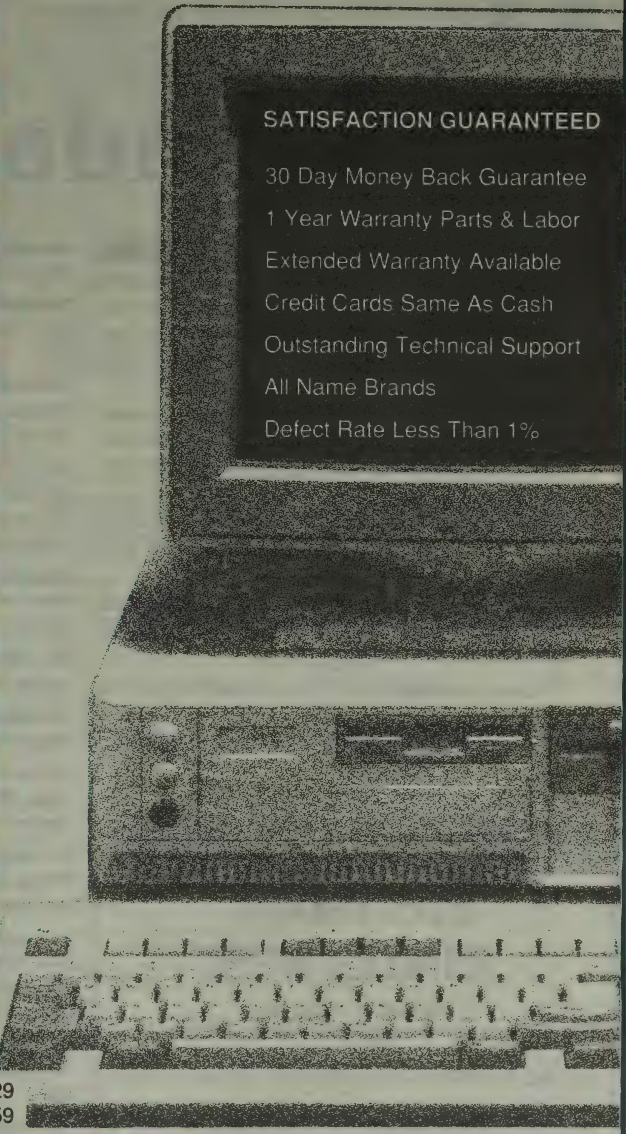

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Calendar Of Events

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November 21–22 Database/Word Processing Software Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

November 21–22 QuarkXPress Essentials Class. San Jose. Informative Edge. Call: (408)730-1217.

November 23 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

November 23 Computer Show & Sale. Alameda County Fairgrounds. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

November 23 Computer Show & Sale. Santa Rosa. MarketPro. Call: (415)388-8893.

November 23 DOS Basic Class. San Francisco. Pioneer Computer. Call: (415)543-4680.

November 23 Pen Software Development Seminar. Dunfey San Mateo Hotel. SEF. Call: Barbara Cass. (415)854-7219.

November 23 Social Impact Of Modern Telecommunications Systems Seminar. San Francisco. SFSU Extended Education. Call: (415)338-1373.

November 23 Video Signal Saga Class. San Francisco. Center for Electronic Art. Call: (415)882-7063.

November 24 Computer Show & Sale. Sacramento. MarketPro. Call: (415)388-8893.

November 25 FileMaker Pro Class. San Francisco. Informative Edge. Call: (415)392-5544.

November 25 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

November 25 Switching To Lotus 1-2-3 Hands-on Training. San Francisco. The Software Training Group. Call: (415)397-4158.

November 25 Training Classes On WordPerfect, Lotus, Quattro Pro, Paradox, And Windows. San Francisco. MicroAge. Call: (415)393-9600.

November 25–26 SQL_Basics Course. Alameda. SymPro University. Call: (510)865-0600.

November 26 Free Windows 3.0 Forum. San Francisco. Software Training Group. Call: Linda Meidenreich, (415)397-4158.

November 26 Intermediate Lotus Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

November 26 Using Lotus 1-2-3 Training Seminar. San Francisco. SFSU Extended Education. Call: (415)338-1373.

November 26–December 17 Adobe Photoshop Class. San Francisco. Center for Electronic Art. Call: (415)882-7063.

November 30 Computer Show & Sale. Vallejo. MarketPro. Call: (415)388-8893.

November 30 IBM PC Clone Troubleshooting And Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

November 30 Intermediate WordPerfect Seminar. San Francisco. SFPCUG. Call: (415)979-5879.

November 30 Intro To dBASE III+ Seminar. San Francisco. SFPCUG. Call: (415)979-5879.

November 30 Intro To Personal Computers Seminar. San Francisco. SFPCUG. Call: (415)979-5879.

DECEMBER

December 1 Computer Show & Sale. Oakland. MarketPro. Call: (415)388-8893.

December 2 Advanced Lotus Training Seminar. San Francisco. Software Training Group. Call: Linda Meidenreich, (415)397-4158.

December 2 Outlining And Presentation Software Workshop. Santa Clara. Symantec Training Group. Call: (415)898-1919.

December 2–3 Adobe Photoshop Class. San Jose. Informative Edge. Call: (408)730-1217.

December 2–3 Advanced PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

December 2–5 Electronic Printer Week Conference. San Jose. BIS Strategic Decisions. Call: 1-800-874-9980.

December 3 MacroMind Director Class, Part 1. San Francisco. Abacus Training. Call: (415)759-2481.

December 3 Novell NetWare Operator Training Course. Alameda. SymPro University. Call: (510)865-0600.

December 3 & 10 Telecommunications Project Planning And Development Seminar. San Francisco. SFSU Extended Education. Call: (415)338-1373.

December 4 Novell NetWare Supervisor Training Course. Alameda. SymPro University. Call: (510)865-0600.

December 4 Technology Careers In Latin America. San Francisco. BOSS-America. Call: (415)626-6706, ext. 2.

December 4 WordPerfect Essentials Class. San Francisco. Informative Edge. Call: (415)392-5544.

December 4–5 Aldus PageMaker Class. San Jose. Informative Edge. Call: (408)730-1217.

Continued

DECEMBER 2–5

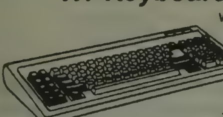
ELECTRONIC PRINTER WEEK

Red Lion Hotel, San Jose

The BIS Strategic Decisions' 1991 Electronic Printer Week includes two back-to-back conferences bringing together key industry players to explore the state of the art of print quality, and examine market issues driving the future. The 10th Annual Print Quality Seminar, December 2–3, will help engineers and imaging scientists to update their knowledge of the latest technical advances. The 1991 Electronic Printer Conference, December 4–5, will provide marketing managers and product planners with the information tools needed to plan for the future. Contact: BIS Strategic Decisions, PO Box 5–0076, Woburn, MA 01815–0076. 1-800-874-9980.

For Unique Christmas Shopping or High Tech Hobbyists...try HSC!

XT Keyboard at XTra low Price!

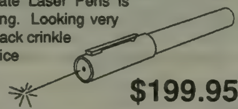


What else is there to say? An 84-key XT-compatible keyboard with Caps, Num and Scroll Lock Status LED's for the low, low price of $24.95! Standard IBM layout, coil cord, 5-pin DIN plug, made for Zenith Data Systems, new out of shipping carton, 90-day warranty. Nice Feel! Get 'em while they last!

Zenith XT Keyboard **HSC#12479** **$19.95**

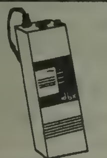
Laser Pen: The Ultimate Stocking Stuffer!

A very limited supply of these Solid-State Laser Pens is available for your early Christmas shopping. Looking very much like a high-class executive pen in black crinkle finish with gold-finish clip, this pointing device contains a class III Laser LED running off three 'N' Cells (included). 1 yr. warranty



$199.95

dbx Noise Reduction Unit for your personal stereo

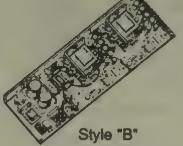


Uses two AAA batteries (not included)
For dbx (or type "B" Dolby) encoded tapes.
4 3/8" x 1 1/4" x 1 3/16", with belt clip.
Reduces tape hiss, increases enjoyment!
HSC #12414 $4.95

Power Supply Specials!

Style	Input	Output	HSC#	Price
"A"	110/220 VAC	5 VDC @ 2 A 12 VDC @ 1A -12VDC @ .25A	12759	$22.50
Skynet switching supply, new -- 2.75" x 5.125" x 1.25" PC Board (no chassis)				
"A"	110/220 VAC	5 VDC @ 2 A 12 VDC @ 1.5A	12758	$17.50
C.P. or Skynet switching supply -- 2" x 6.25" x 1.25" PC Board (no chassis) Used, tested good (Note, Skynet is .75" shorter than C.P.)				
"B"	110/220 VAC	5 VDC @ 32 A 12 VDC @ 4 A -12 VDC @ 1 A	10928	$ 9.95
Closeout of HUGE switching p.s. - 13.5" x 5" x 2.5" on frame. 250 Watts!				
"C"	110/220 VAC	24 VDC @ 2.4 A	8611	$ 7.95
Condor linear supply - 5" x 5.5" x 3" on frame, new. Large quantity!				

Style "A"

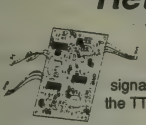


Style "B"

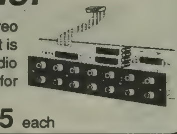
Style "C"

Note: Illustrations are approximate representations only, and not to scale!

Return of the Amazing Hobbyist Project Boards!



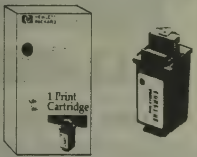
You may remember these items from over a year ago...well, we found a few more! The board at left is a MTS Stereo decoder board from a television accessory device. We provide a pinout diagram for the connectors, but the rest is up to you! The item shown at right is a digital audio switch from the same television accessory unit. It will divert audio signals from five different (stereo!) inputs to two different sets of output jacks. We provide a schematic and truth-table for the TTL inputs to control direction of the output. Your choice of project board, $9.95 each while they last!



$9.95 each

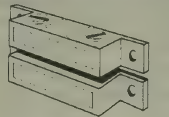
Attention HP DeskJet Owners!...

Genuine HP DeskJet Print Cartridge #51608A (Black Ink) Limited Quantity, while they last!
HSC#12747 2/$17.50



Alarming?

Reed Switch/Magnet Sets for home or office Burglar Alarm installations. Choice of Dark Brown or White.



10/$10.00

Ramsey Kits for the Ham Hobbyist...

HSC is proud to feature Ramsey Electronics Kits for the electronics hobbyist and "do-it-yourself" crowd...and they make more than just LED blinkers and sound-effects generators! Look at some of these exciting Amateur Radio projects! Send a SASE for complete list of kits available at HSC!

QRP-20, 30, 40, or 80 **Ham Transmitter kits for 20, 30, 40 or 80 Meters:** One-watt creystal controlled rigs with front panel switch for choosing between two VXO-controlled crystals, giving frequency range of up to 20 KHz. Pi-network antenna coupling to diode protected receiver T-R antenna jack. VSWR protection, VCO frequency tuning, 12 - 14 VDC operation. Each kit, $29.95 Case and knob kit, $12.95

HR-20, 30, 40, or 80 **Ham Receiver kits for 20, 30, 40 or 80 Meters:** Companion receivers to above transmitters. Better than 2 uV sensitivity, front panel RF Gain control, Audio Gain control, smooth varactor tuning, no toroids to wind! Uses popular NE602 IC and LM386 for audio output stage. Runs off a regular 9 V battery (not included). Each kit, $27.95 Case and knob kit, $12.95

FTR-146 **2-Meter Synthesized Transceiver kit:** No crystals! True freq. synthesis for 144 - 148 MHz. Front panel selection of favorite freq. pairs, 5 Watts RF Output. $129.95, Case and knob kit $24.95

Halted specialties co. HSC Electronic Supply

Toll Free (Orders Only) 1-800-4 HALTED (1-800-442-5833)

Retail Stores:

3500 Ryder St., Santa Clara, CA 95051 (408)732-1573
4837 Amber Ln., Sacramento, CA 95841 (916)338-2545
6819 Redwood Dr., Cotati, CA 94931 (707)792-2277

Hi-Fi Speaker Components for the "Do-it-yourself" crowd...

HSC does not often get audio gear, but when we do you know it means savings! Take a look at these high quality sound itemsfor the amateur audiophile, but don't look too long, as stock is definitely limited!

HSC#	Description	Price
12741	dbx 10" Woofer, 2" Voice Coil, 4.25"x1.5" Magnet, Black Paper Cone, Foam Suspension	$19.95
12274	dbx 4" Midrange, sealed back (See "A" below)	$ 6.95
12739	dbx 1" Tweeter, .5" Voice Coil, Mylar Cone, Flanged 3" metal mounting grille	$ 9.95
12740	dbx 4-way Crossover network/terminal panel for above speakers (uses two Tweeters)	$ 4.95

*Special Package Deal! Get a complete set of the above (1Woofer, 1Midrange, 2 Tweeters & 1 Crossover) for **$39.95** (save $11.80!)*

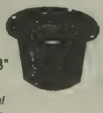
Limit: Two sets per customer!

HSC#	Description	Price
12422	8" Woofer, 1.75" Voice Coil, 3.25"x1.125" Magnet, Black Paper Cone, Foam Suspension (See "C" below)	$12.95
12742	10" Woofer, 1.25" Voice Coil, 3.25"x1" Magnet White or Black Paper Cone, Foam Suspension	$14.95

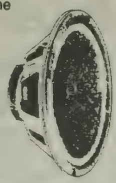
Also, Extremely Limited Quantities Available, First Come First Served:

15" Woofer, 1.75" Voice Coil, 3.5" Square Magnet, Paper/Foam	$17.95
15" Woofer, 1.25" Dual Voice Coil, 4"x1.5" Magnet, White Paper Cone, Foam Suspension (Good for Sub-Woofer!)	$29.95
8" Woofer, 1.75" Dual Voice Coil, 4"x1.125" Magnet, Black Paper Cone, Foam Suspension (Good for Sub-Woofer!)	$24.95
4" Midrange, 1" Voice Coil, 1.75"x.625" Magnet, Sealed Back (See "B" below), Black Paper Cone	$ 7.95

"A"



"B"



"C"

Sorry, we do not have any technical specifications on any of these items.

Terms: Some quantities are limited; all items subject to prior sale. **Minimum order: $10.00 plus shipping.** Orders under $20.00 subject to $2.00 handling fee. All orders shipped FOB Santa Clara, CA (this means you pay freight!) by UPS Surface (no P.O. Boxes) unless otherwise specified, in which case prevailing carrier rate plus $5.00 handling fee applies. Prepaid orders for merchandise amounts only will be shipped freight COD. If you have questions about your order, call Customer Service at (408) 732-1854 M-F 9AM to 5PM PST.

Athena Solution Inc.

486/386/286 Basic System:

M/B + CPU + 2 H.D./2 F.D. Controller + 1.44 MB F.D. + Internal Clock/Calendar + Math Co-Processor + I/O: 2S/1P/1G Ports + CASE + Power Supply + 101-Key Keyboard + 1MB Memory (512K for 286)

486-33 w/64K Cache	**$866**
386-40 w/64K Cache	**586**
386-33 w/64K Cache	**546**
386-25 w/64K Cache	**526**
386-25 No Cache	**476**
386SX-25 w/32K Cache	**426**
386SX-25 No Cache	**406**
386SX-20 w/32K Cache	**396**
386SX-20	**376**
386SX-16	**346**
386-20	**296**
286-16	**266**
286-12	**256**

Motherboards For Upgrades:

INCLUDES CPU

486-33 w/64K Cache	$670
386-40 w/64K Cache	395
386-33 w/64K Cache	370
386-25	278
386SX-25 w/32K Cache	225
386SX-20 w/32K Cache	210
386SX-20	180
386SX-16	145
286-20	90
286-16	75
286-12	48

Memory:

SIMM	
256K x 9-70	$12
1M x 9-70	39 (9 chips)
1M x 9-70	37 (3 chips)
4M x 9-70	150
SIPP	
256K x 9-80	12
1M x 9-80	38

PC Networking Cards & Accessories:

LAN Card (Ethernet)	
8 Bit (NE 1000 Compatible)	$80
16 Bit (NE 2000 Compatible)	90
8 Bit 10 Base T (NE 1000 Compatible)	90
16 Bit 10 Base T (NE 2000 Compatible)	100
RG-58 Cable 15 Ft	10
25 Ft	15
50 Ohm Terminator	2
T-Connector	3

Mouse & Modems:

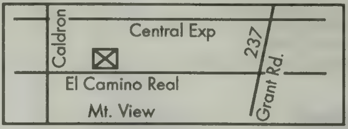
Internal 2400 Modem	$47
Mouse-3 Button MS Compat	15
3 Button MS Compat Dynamic	18
Deluxe Package	25

Floppy & Hard Drives:

Teac F.D. 1.44 MB	$52
1.2 MB	54
Conner H.D. 40 MB	160
80 MB	265
100 MB	295
120 MB	315
200 MB	515

Add-On Cards/Video Cards/Monitors

IDE	$13
AT I/O (2S/1P/1G)	13
IDE w/ I/O	20
Oak VGA 800 x 600	40
Oak SVGA 1024 x 768 w/512K	50
Trident SVGA 1024 x 768 w/1MB	75
14" SVGA Monitor	275
12" Mono Monitor	74



Athena Solution Inc.
100 W. El Camino Real #68
Mountain View, Ca 94040
TEL: (415) 962-8686
Fax: (415) 969-3361
Hours: Mon-Fri 8:30-5:30
Cash Prices Shown
Prices Subject to Change w/o Notice

Calendar Of Events continued

December 4–6 Project Management Software Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

December 5 Automated Accounting Workshop. San Francisco. J.C. Lukrich & Co. Call: Beth Markus, (415)905-6900.

December 5 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

December 5 Novell NetWare System Manager Training Course. Alameda. SymPro University. Call: (510)865-0600.

December 5 Using System 7.0 Class. San Francisco. Abacus Training. Call: (415)759-2481.

December 5 WordPerfect 5.1 Level 1 Class. San Francisco. Abacus Training. Call: (415)759-2481.

December 6 Intro To Paradox Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

December 7 Building & Upgrading An IBM PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

December 7 Computer Show & Sale. Santa Clara County Fairgrounds. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

December 7 Intro To LANs Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

December 7 MacroMind MediaMaker Seminar. San Jose. Masters Institute. Call: (408)441-1800.

December 9 Aldus Persuasion For The PC Class. San Jose. Informative Edge. Call: (408)730-1217.

December 9 Beginning PAL Class. San Francisco. Abacus Training. Call: (415)759-2481.

December 9 Creative Computing TV Show. Channel 25, San Francisco.

December 9 Excel Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

December 9 Novell SQL Database Server Seminar. Alameda. SymPro University. Call: (510)865-0600.

December 9–10 FrameMaker For Macintosh Class. San Francisco. Informative Edge. Call: (415)392-5544.

December 9–10 LAN Manager—System Administration Course. Alameda. SymPro University. Call: (510)865-0600.

December 9–11 Sun User Group Ninth Annual Conference & Exhibit. San Jose. Sun User Group. Call: (415)948-0998.

December 9–13 X Window System Training. Santa Clara. ICS. Call: (617)621-0060. Email: info@ics.com.

December 10 FileMaker Pro Class, Part 1. San Francisco. Abacus Training. Call: (415)759-2481.

December 11 Frame Bookbuilding Class. San Francisco. Informative Edge. Call: (415)392-5544.

December 11 Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

December 11 Macintosh Networks Class. San Francisco. Abacus Training. Call: (415)759-2481.

December 11 Merge Mailing In Russia:

DESKTOP PUBLISHING CLASSES

LANEY COLLEGE, OAKLAND

The Graphic Arts Department at Laney College offers two classes on publishing as part of its regular course schedule. In Electronic Publishing, beginning December 1 and lasting eighteen weeks, students will primarily use PageMaker and CorelDraw. The second class, Design for General Printing and Desktop Publishing, begins January 14, 1992, and also runs for eighteen weeks. Both classes are $18 plus $2 administrative fees, each. For more information, call: Laney College, (510)464-3263.

Continued

SYSTENDER INTERNATIONAL

...SERVING YOUR COMPUTING NEEDS SINCE 1986

Complete Systems	486DX-33C	386DX-33C	386SX-25C	386SX-16C	286-12C
Memory Installed	4 MB	4 MB	1 MB	1 MB	1 MB
Cache Installed	64K	64K	32K	-	-
Disk Controller	ESDI w/64K	ESDI w/64K	IDE2	IDE2	IDE2
Hard Drive	330 MB	330 MB	40 MB	40 MB	40 MB
Drive A	5 1/4" 1.2 MB	5 1/4" 1.2 MB	1.2 or 1.44 MB	1.2 or 1.44 MB	1.2 or 1.44MB
Drive B	3 1/2" 1.44 MB	3 1/2" 1.44 MB	-	-	-
Video Card	1024x768	1024x768	800x600	800x600	800x600
Monitor	Goldstar 1460	Goldstar 1460	Goldstar 1430	Goldstar1430	Goldstar 3051
AT I/O (2S,1P.1G)	Yes	Yes	Yes	Yes	Yes
Keyboard	AT Enhanced	At Enhanced	AT Enhanced	AT Enhanced	AT Enhanced
Case	Vertical	Vertical	Vertical	Desktop	Desktop
Power Supply	250W	200W	200W	200W	200W
PRICE	**$2249**	**$1859**	**$959**	**$869**	**$699**

Basic Systems	Memory	Cache	BIOS	Disk Ctrlr	Drive A	I/O	Keyboard	Case/PS	Price
486DX-33B	1 MB	64K	AMI	IDE2	1.2 or 1.44	2S,1P	Yes	Vertical/250W	**$999**
386DX-33B	1 MB	64K	AMI	IDE2	1.2 or 1.44	2S,1P	Yes	Vertical/200W	**639**
386SX-25B	1 MB	32K	AMI	IDE2	1.2 or 1.44	2S,1P	Yes	Vertical/200W	**469**
386SX-16B	1 MB	–	AMI	IDE2	1.2 or 1.44	2S,1P	Yes	Desktop/200W	**379**
286SX-12B	1 MB		C&T	IDE2	1.2 or 1.44	2S,1P	Yes	Vertical/200W	**285**

Motherboards (0 KB, with CPU)

286-C12	C&T BIOS	**$67**
386SX-H16	AMI BIOS	**170**
386SX-H20	AMI BIOS	**200**
386SX-H25-32	AMI BIOS	**260**
386DX-025	AMI BIOS	**375**
386DX-C33-64	AMI BIOS	**420**
386DX-S40-64	AMI BIOS	**440**
486DX-E33-64	AMI BIOS	**800**

Disk Drives

Chinon Floppy	5 1/4" 360KB/3 1/2" 720 KB	**$55**
Chinon Floppy	5 1/4" 1.2 MB/ 3 1/2" 1.44 MB	**55**

Atasi

638	330 MB , 18ms	ESDI	**$799**

Fujitsu

M2612T	90 MB, 19ms	IDE	**$429**
M2614T	180 MB, 19ms	IDE	**725**
M2263E	667 MB, 15ms	IDE	**1599**

Seagate

157A	42 MB, 28ms	IDE	**$199**
1144A	125 MB, 19ms	IDE	**409**
1239A	215 MB, 15ms	IDE	**645**

Toshiba

234	100 MB, 16ms	IDE	**$369**

Western Digital

WD93044	42 MB, 25ms	IDE	**$179**
WD280A	84 MB, 18ms	IDE	**290**
WD2120	125 MB, 16ms	IDE	**360**
WD4200	215 MB, 16ms	IDE	**625**

Disk Controllers

IDE2	2 FD, 2 HD, 16 Bit, IDE	**$15**
IDE4	4 FD, 2 HD, 16 Bit, IDE	**30**
Ultrastor	2 FD, 2 HD, 16 Bit, ESDI 32K Cache	**155**

Keyboards

BTC 5339SX	102 Key	**$35**
BTC 7039R	102 Key	**45**

Monitors

Goldstar 3051	14" VGA 640x480, 0.51mm	**$209**
Goldstar 1430	14" VGA 640x480, 0.31mm	**289**
Goldstar 1460	14" VGA 1024x768, 0.28mm	**329**
Supertron 1411	14" Mono, paper white	**99**
Supertron 1421	14" Mono, amber	**99**
Win 12HC	12" Mono, amber	**75**
Win 14HC	14" Mono, amber	**99**
Win 1432	14" VGA 640x480, 0.31mm	**289**
Win 1433	14" VGA 1024x768, 0.28mm	**329**
OEM 12A	12" Mono, amber	**75**

Video Cards

MGP	Mono with Parallel Port	**$20**
Oak VGA	800x600, 16 Bit, 256K	**45**
Oak Super VGA	1024x768, 16 Bit, 512K	**65**
Paradise VGA-16	1024x768, 16 Bit, 512K	**90**
Trident 8900	1024x768, 256K Colors, 1 MB	**100**

Modems and Fax Cards

Hedaka 2400 bps internal modem	**$55**
9600 FAX send/2400 internal modem	**95**
MICC 9642PC modem	**160**
MICC 9600PC modem	**385**
MICC 9610SA modem	**649**

I/O Cards and Mouse

AT I/O (2 Serial, 1 parallel, 1 game)	**$19**
Info serial mouse	**29**
Logitech mouse-man-serial	**69**
Logitech mouse-man-bus	**79**

Others

Microsoft Windows 3.0	**$115**
MS-DOS 3.3	**65**
MS-DOS 4.01	**68**
MS-DOS 5.0	**75**

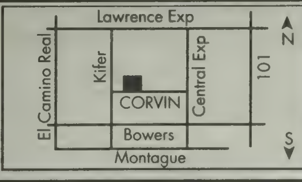
Memory, Math Co-Processor
Please Call For Specifics

All systems are fully tested, and burned in for 48 hours. One year parts and labor warranty, Government, Corporate and School PO's are welcome. Shipping charge is extra. No refunds on freight charges. Prices are valid on 10/25/91 and are subject to change w/o notice.

SYSTENDER
International Corporation
2900 CORVIN DRIVE
SANTA CLARA, CA 95051

ONE YEAR PARTS AND LABOR WARRANTY

TEL: (408) 732-1990
FAX: (408) 732-7030



Calendar Of Events continued

Reaching New Markets. San Francisco. BOSS-America. Call: (415)626-6706, ext. 2.

December 11–13 LAN Manager—Operations Course. Alameda. SymPro University. Call: (510)865-0600.

December 12 Beginning Microsoft Word For The Macintosh Class. San Francisco. Abacus Training. Call: (415)759-2481.

December 12 How To Successfully Automate Your Accounting System Seminar. San Francisco. J.C. Lukrich & Co. Call: Beth Markus, (415)905-6900.

December 12–13 Implementing Distributed Database Seminar. San Francisco. Digital Consulting. Call: (508)470-3880.

December 13 WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

December 14 Computer Show & Sale. Cow Palace. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

December 14 Computer Show & Sale. Sonoma County Fairgrounds. MarketPro. Call: (415)388-8893.

December 14 IBM PC Clone Troubleshooting And Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

December 14 Voice And Data Integration Seminar. San Francisco. SFSU Extended Education. Call: (415)338-1373.

December 15 Computer Show & Sale. Cal Expo, Sacramento. MarketPro. Call: (415)388-8893.

December 16 DOS Essentials Class. San Francisco. Informative Edge. Call: (415)392-5544.

December 16–18 Project Management Software Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

December 17 FileMaker Pro Class, Part 2. San Francisco. Abacus Training. Call: (415)759-2481.

December 17 Free DOS 5.0 Forum. San Francisco. Software Training Group. Call: Linda Meidenreich, (415)397-4158.

December 17 WordPerfect 5.1 Level 2 Class. San Francisco. Abacus Training. Call: (415)759-2481.

December 17–20 Windows 3.0—Support Engineer Course. Alameda. SymPro University. Call: (510)865-0600.

December 18 News On The Software Industry, Presentation By Tim Bajarin. Palo Alto. SEF. Call: Barbara Cass. (415)854-7219.

December 18 Novell NetWare System Manager Training Course. Alameda. SymPro University. Call: (510)865-0600.

December 18 Technology Careers In Latin America. San Francisco. BOSS-America. Call: (415)626-6706, ext. 2.

December 18 Using MacDraw Pro Class. San Francisco. Abacus Training. Call: (415)759-2481.

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December 19 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

December 19 Excel For Windows Class. San Francisco. Informative Edge. Call: (415)392-5544.

December 19–20 Database/Word Processing Software Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

December 19–20 Novell NetWare 386 Advanced Features Training Course. Alameda. SymPro University. Call: (510)865-0600.

December 20 MacDraw Pro Class, Advanced Features. San Francisco. Abacus Training. Call: (415)759-2481.

December 20 Mac Essentials Class. San Jose. Informative Edge. Call: (408)730-1217.

December 21 Computer Show & Sale. Alameda County Fairgrounds. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

December 21 Computer Show & Sale. Monterey Conference Center. MarketPro. Call: (415)388-8893.

December 21–22 Computer Literacy Weekend Workshop. San Francisco. Software Training Group. Call: Linda Meidenreich, (415)397-4158.

December 22 Computer Show & Sale. Bay Bridge Holiday Inn, Emeryville. MarketPro. Call: (415)388-8893.

December 23 WordPerfect 5.1 Level 3 Class. San Francisco. Abacus Training. Call: (415)759-2481.

December 26–27 QuarkXPress Essentials Class. San Francisco. Informative Edge. Call: (415)392-5544.

December 28 Computer Show & Sale. Santa Clara County Fairgrounds. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

December 28 Computer Show & Sale. Solano County Fairgrounds. MarketPro. Call: (415)388-8893.

December 29 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

December 29 Computer Show & Sale. Centennial Hall, Hayward. MarketPro. Call: (415)388-8893.

December 30 Windows 3.0 Level 1 Class. San Francisco. Abacus Training. Call: (415)759-2481.

December 30–31 Adobe Illustrator Class. San Jose. Informative Edge. Call: (408)730-1217.

JANUARY

January 5 Computer Show & Sale. Scottish Rite Temple, Sacramento. MarketPro. Call: (415)388-8893.

January 6–8 Project Management Software Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

January 8 Merge Mailing In Russia: Reach-

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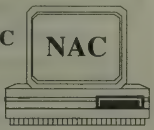

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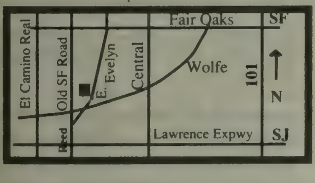

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January 9 Design Principles For Non-Designers Presentation. San Rafael. DTP SIG and North Bay VVPUG. Call: Ken Dickinson, (415)507-0384.

January 11 Building & Upgrading An IBM PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 15 Technology Careers In Latin America. San Francisco. BOSS-America. Call: (415)626-6706, ext. 2.

January 16–17 Advanced PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 16–18 Tenth Annual National Conference On Technology & Reading/Learning Difficulties. San Francisco. Educational Computer Conferences. Call: 1-800-255-2218.

January 18 IBM PC Clone Troubleshooting And Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 21–23 UniForum Conference. San Francisco. Smith & Shows. Call: (708)299-1313.

January 22 Merge Mailing In Russia: Reaching New Markets. San Francisco. BOSS-America. Call: (415)626-6706, ext. 2.

January 22–24 NeXTWORLD Expo: First International NeXT Conference. San Francisco. *NeXTWORLD* Magazine. Call: World Expo Corp., (508)879-6700.

January 23–24 Advanced PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 25 IBM PC Clone Advanced Troubleshooting & Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

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Cool Ads. (408)378-3322 (1200/2400); 378-3355 (9600). Fax: (408)378-0915. [Exp. #91.]

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Cruzio. (408)423-9995. 8-N-1, 1200/2400/9600/19,200. Santa Cruz, email, USENET newsgroups, calendar, agency & gov't directory listings. Sysop: Chris Neklason & Peggy Dolgenos. [Exp. #92.]

The Cutting Edge BBS. (408)479-3364. 8-N-1, 24 hrs., 300/1200/2400. Online doors and IBM files, Ad Lib files. Sysop: Daniel Duerr. CoSysop: Numdum. [Exp. #89.]

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Infoserve Connections. (408)243-2102. 8-N-1, 24 hrs., 2400. UUCP/Usenet/email for DOS, Mac, and 386/UNIX. Sysop: B. Oesterreich. [Exp. #92.]

Lynn-Western Newswires. (408)778-5994 & 778-9656. 8-N-1, 24 hrs., 1200/2400. FidoNet 1:143/304. Professional information on technology, management, and worldwide investment news. Stock Market data online. [Exp. #92.]

Major League BBS. (408)997-8591. 1200/2400/9600. Fidonet 1:143/313. Mailnet 20:257/752. RBBSnet. Sysop: Adam Michlin. [Exp. #89.]

Mongoose BBS. (408)733-3034. 24 hrs., 1200/14,000, V.42BIS. 31,000 files, 2.4GB. Sysop: Robert Yag. [Exp. #89.]

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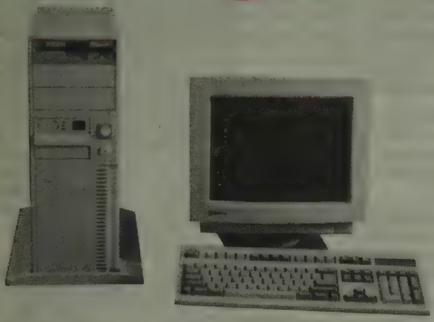

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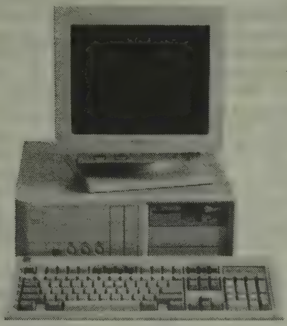

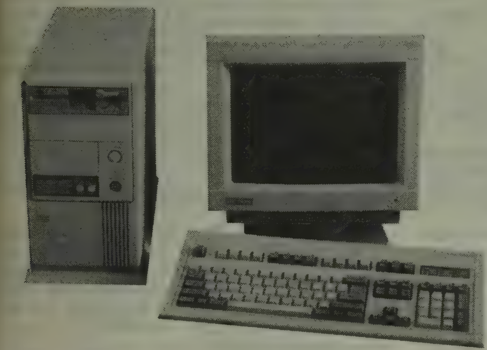

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Pacific Exchange (Sacramento) News. (916)965-0301. 11,000+ files, online restaurants & recipes. [Exp. #89.]

ASSOCIATIONS

American Association for Artificial Intelligence (AAAI). Call: Rick Skalsky, (415)328-3123. [Exp. #91.]

Association for Women in Computing. Meetings: 1st Wed., 5:30 pm, San Francisco. Call: (415)979-8450. [Exp. #93.]

The Association for Worldwide Software Support Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #92.]

Bay Area Clipper Developers Association. Meetings: 4th Mon., 7:00 pm, Fort Mason, Bldg. C. Call: Barbara Paltiel, (415)345-0152. [Exp. #92.]

The Black Data Processing Associates, Silicon Valley Chapter. Meetings: 4th Thurs.,

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386-25	279	459	699	859	889	992	1052
386-25/64C	358	519	759	919	952	1052	1112
386-33	368	529	772	929	962	1059	1119
386-33/64C	379	539	779	938	968	1068	1128
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486-33/64C	759	946	1159	1299	1359	1465	1498

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ASSOCIATIONS

6:30 pm, Amdahl Corp., Sunnyvale. Call: Doug Jones, (408)737-5999. [Exp. #94.]

Computer Professionals for Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, room 608-7. Call: Judy Stern, (510)643-7499. [Exp. #92.]

Data Processing Management Association. Call: (415)978-0868. [Exp. #91.]

IEEE Computer Society, San Francisco Chapter. Meetings: 3rd Thurs. Call: (415)905-4400. [Exp. #92.]

Independent Computer Consultants Association, Silicon Valley Chapter. Meetings: 4th Thurs., 6:00 pm. Meetings are open to all. Call: ICCA, (408)492-8888. [Exp. #92.]

Independent Computer Consultants Association. Meetings: 2nd Wed., 6:00 pm. Meetings are open to nonmembers and members. Call: ICCA, (415)441-2948. [Exp. #91.]

Networkers' Toastmasters. Meetings: Every Tues., noon–1:00 pm, 2560 N. First St., San Jose. Call: Mona Kellem, (408)534-1255. [Exp. #92.]

North Bay Systems Professionals. Meetings: 3rd Wed., 7:00 pm, Holiday Inn, Terra Linda, 1010 Northgate Dr., San Rafael. NBSP provides a forum and network for system professionals. Call: Harry Chapman, (415)291-0174. [Exp. #95.]

Society for Technical Communication, Berkeley Chapter. Meetings: 2nd Wed., 6:00 pm, Yenching Restaurant, 2017 Shattuck Ave., Berkeley. Call: Rich Julius, (415)837-0397. [Exp #91.]

Society for Technical Communication, East Bay Chapter. Meetings: 1st Thurs. Call: Corinne Stefanick, (510)769-8931. [Exp. #92.]

Society for Technical Communication, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)985-7121. [Exp. #92.]

Society for Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. Call: September Jenner, (408)971-2336. [Exp. #91.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #92.]

United Sysops Association. Meetings: 2nd Wed., 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Assoc. for system operators and BBS users. Call: Bill Strouse, (408)453-3321. [Exp. #89.]

Women's Computer Society. Meetings: Last Tues. Call: Tanya Halepota, (415)949-3936. [Exp. #91.]

USER GROUPS

ACCOUNTING SOFTWARE

Account-Mate Bay Area User Group. Meetings: 3rd Thurs., 7:00 pm, S. Branch Berkeley Library, 1901 Russell. Call: Bohen, (510)465-7815. [Exp. #93.]

Computer Associates User Group. Meetings: 1st month of quarter on 3rd Wednesdays. Holiday Inn, 1500 Van Ness. Come share ideas and information with other local users of Computer Associates Accounting Software! Call: Beth E. Markus, (415)864-6770. [Exp. #93.]

AMIGA

A500 Programming Team. A club for those Amiga users who can write programs for A500. Call: Michael, (408)270-4596. [Exp. #95.]

AAA—Amiga Addicts Anonymous. Meetings: 3rd Tues., Concord Water District Bldg., 1311 Concord Ave. Classes, BBS, pub. dom. disks, info line. Call: (510)935-0829. [Exp. #92.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #95.]

ALF—Amiga Learners Forum. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Beginners group. Call: (408)262-9334. [Exp. #89.]

Amiga Nation. Meetings: 1st Tues., 7:30 pm, 304 Springs St., Old Suisun. Call: Ron, (707)421-2283. [Exp. #95.]

AUM—Amiga Users of Marin. Meetings: 3rd Wed., 7:30 pm, rm. 190, Science Center, College of Marin. Call: Bob, (415)924-5384. AUMBBS: (415)485-5895. [Exp. #92.]

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary, SF. Call: (415)584-8406. [Exp. #92.]

FAUG—First Amiga User's Group. Meetings: 1st Tues., 7:00 pm, Palo Alto Hyatt. Call: Mike Fisher, (415)855-9426, BBS (415)595-2679. [Exp. #91.]

3rd Dimension—Image/Lightwave User Group. Meetings: 1st, 3rd & 5th Mon., Computer Showcase, 2739 Geary Blvd, SF. Call: Ollie, (415)863-8792. [Exp. #93.]

APL

APL Bay Area User Group. Meetings: 2nd Mon., 7:00 pm. Call: Tibor Horvath, (415)283-5611. [Exp. #91.]

APRICOT

Apricot User Group, East Bay Chapter. For Apricot and other IBM-compatible PCs, hardware/software assistance & info. New members welcome. Call: Ron, (510)828-9643. [Exp. #95.]

AT&T UNIX

AT&T Computer User Group, North Bay. Meetings: 1st Wed., new user education, 6:00 pm, program, 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. Call: Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #91.]

AT&T Computer User Group, South Bay. Meetings: 3rd Wed., new user education, 6:00 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #91.]

AT&T Computer Users Group, San Francisco. Meetings: 1st Wed., 7:00 pm, 50 Fremont St., 40th Fl. Call: (415)885-6631. [Exp. #92.]

AT&T Computer Users Group, Sunnyvale. Meetings: 2nd Wed., 7:00 pm. Refreshments, technical support, and informal discussions. Call: Jim Lansing, (415)885-6631. [Exp. #91.]

AT&T Computer Users Group, Sunnyvale—DOS Group. Meetings: 3rd Wed., 6:00 pm, 1090 E. Duane Ave., off Lawrence Expwy. Call: (415)885-6631. [Exp. #92.]

AT&T Computer Users Group, Sunnyvale—UNIX Group. Meetings: 4th Wed., 7:00 pm, 1090 E. Duane Ave., off Lawrence Expwy. Call: (415)885-6631. [Exp. #92.]

AT&T UNIX Computer User Group, South Bay. Meetings: 4th Wed., new user education, 6:30 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #91.]

ATARI

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Aud., 2nd fl., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #93.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Public Library, 300 Estudillo Ave. 8/16/32-bit, SIGs. Call: Bob Wolley, (510)865-1672. [Exp. #93.]

Santa Clara Atari User Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computers Showroom, 1278 Alma Court, San Jose, near First and Alma. Call: Ron Reade, President, (408)225-7162: BBS: (408)848-6032, 300/1200/2400. [Exp. #94.]

ST Programming Team. A club for those Atari users who can write programs for ST/STE. Call: Michael, (408)270-4596. [Exp. #95.]

CAD/CAM

S.F. AutoCAD User Group. Meetings: 1st Mon. Call: Mark Williamson (415)383-4060. [Exp. #89.]

COMMODORE

CAVE—Commodore Amiga Video Enthusiasts. Meetings: Every other Sat., 8:00 pm, 304 Springs St., Old Suisun. Call: Ron, (707)421-2283. [Exp. #95.]

The Commie Party. Meetings: 175 Henry St., SF, CA 94114. Call: The Carrier Cafe BBS, (415)863-2981. [Exp. #93.]

Commodore Hayward User Group. Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (510)793-2514. [Exp. #93.]

Cupertino Chapter of 64/More Commodore User Group. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. [Exp. #93.]

CWEST Commodore 64/128. Meetings: 3rd. Wed., 7:00 pm, Fort Mason. For info: 1564 Waller #B, San Francisco, 94117. Call: (415)626-9946. BBS, (415)552-9320. [Exp. #93.]

North Valley Chapter of 64/More Commodore User Group. Meetings: 2nd Sat, 10:00 am, Milpitas Library. Call: (408)262-9334. [Exp. #93.]

CP/M

San Francisco Computer Society. Meetings: 7:00 pm, Laguna Honda School, 1350 7th Ave., San Francisco. Call: Ralph Gallegher, (415)929-0252. [Exp. #93.]

dBASE

East Bay Database User Group. Meetings: 3rd Sun., 1:30 pm, 2415 Grant St., Berkeley. Call: David Chilcott, (510)653-1303. [Exp. #93.]

Silicon Valley Computer Society X-Base Language Group/dBASE SIG. Meetings: 1st Tues., 7:00 pm, Birchwood Systems, 2001 Gateway Pl., Suite 480 W., San Jose. Call: Fletcher Johnson (408)283-1333 (days & early evenings). [Exp. #91.]

Silicon Valley Computer Society X-Base Language Group/FoxPro SIG. Meetings: 2nd Thurs., 7:00 pm, Birchwood Systems, 2001 Gateway Pl., Suite 480 W., San Jose. Call: Fletcher Johnson (408)283-1333 (days & early evenings). [Exp. #91.]

DESKTOP PUBLISHING

Bay Area Desktop Publishing User Group. Meetings: 1st Tues., 7:00 pm, 2493 Telegraph Ave., Berkeley. Computer-based tutorials on PageMaker 4.0. Speaker: Dr. C.J. Wallia. Call: (510)548-7712. [Exp. #92.]

EPSON

Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #89.]

FORTH

Forth Interest Group of North Bay. Meetings: 2nd Sat., 1–5 pm, 2055 Center St., Berkeley. Tutorial at noon. Call: Leonard Morgenstern, (415)376-5241. [Exp. #89.]

Sacramento FORTH Interest Group. Meetings: 4th Wed., 7:00 pm, SMUD, 1708 59th St., rm. A. Call: Bob Nash, (916)487-2044. [Exp. #92.]

FREEDOM, PRIVACY, AND TECHNOLOGY

BMUG SIG on Freedom, Privacy, and Technology. Meetings: Last Sun., 2:00 pm, BMUG office, 2055 Center St., Berkeley. Call: Judi Clark, (510)549-2684. [Exp. #93.]

IBM AND COMPATIBLES

Computer Beginner & User Group. For all IBM, Amiga, Atari beginners or experienced users. Software/hardware assistance & info. Call: Michael, (408)274-7330. [Exp. #93.]

EastBay FOG. Meetings: 2nd Wed. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #91.]

Gaming Strategy Group. Fast, detailed hints & strategies on all IBM games. Call: Michael, (408)270-4596. [Exp. #93.]

Golden Gate Computer Society (GGCS). Meetings: 4th Mon., 7:30 pm, San Rafael Community Center. Call: Steve Greenberg, (415)485-0136. [Exp. #95.]

Napa Valley PC User Group. Meetings: 2nd Wed., 7:30 pm, 10 Chapel Hill Dr., Napa. Call: Lee Schwab. [Exp. #93.]

PC Programming Team. A club for those IBM users who can write programs for 286, 386, PS/2 PC. Call: (408)270-4596. [Exp. #95.]

Peninsula Computer Club. Meetings: 2nd Thurs., 7:30 pm, Social Room, 222 Laurel St., San Carlos. DOS and CP/M libraries. Call: Larry Welling, (415)593-3391. BBS (415)571-9259. [Exp. #92.]

Pro Players. Club for all games and utilities users. Write: PO Box 84144, Hung Hom Bay Post Office, Hong Kong. [Exp. #93.]

San Francisco Business Computers. Meetings: 4th Thurs., 5:30 pm. For those who use computers in business. Visitors $5. Call: Jordan Rosenberg, (415)788-5338. [Exp. #92.]

San Francisco Computer Society. Meetings: 1st Mon., 7:00 pm, Laguna Honda School, 1350 7th Ave., San Francisco. Call: Ralph Gallegher, (415)929-0252. [Exp. #93.]

KNOWLEDGE-MAN

Bay Area KnowledgeMan (and Guru) User Group. Meetings: 1st Tues., 6:30 pm., JNZ, Inc., 826 Las Trampas Rd., Lafayette. A forum for discussion and info concerning mdbs products, esp. KnowledgeMan and Guru. Call: (510)947-4878. [Exp. #89.]

MACINTOSH

BMUG West. Meetings: Last Mon., 6:30 pm, San Francisco Exploratorium. Call: (510)549-BMUG. [Exp. #95.]

BMUG—Berkeley Macintosh User Group. Meetings: Every Thurs., 6:00 pm, Physical Sciences Lecture Hall, UC Berkeley Campus. Call: (510)549-BMUG. [Exp. #95.]

International Macintosh User Group. Meetings: 3rd Thurs., 7:00 pm, Apple Computer, 10500 N. De Anza Blvd., Cupertino. Mission: Act as a forum for people interested in using Macintosh computers in different languages. Call: Sachiko Berry, (408)826-7724, weekdays. [Exp. #93.]

SPC Apple User Group. Meetings: 2nd Wed., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Jim Weil, (415)796-7169. [Exp. #95.]

Women's Macintosh User Group. Meetings: 2nd Tues., 7:00 pm, ComputerWare, Palo Alto. Call: Buffy Joseph, (415)792-2840 or Tayna Halepota, (415)949-3936. [Exp. #89.]

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USER GROUPS

MULTIMEDIA

BMUG Multimedia SIG. Meetings: 2nd Mon., 6:00 pm, Call: (510)549-BMUG. [Exp. #95.]

International Interactive Communications Society—IICS. Meetings: 2nd Wed., 7:30 pm, Call: IICS Hotline, (415)328-7318. [Exp. #93.]

Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Palo Alto, Rm. H-1. SIG of Software Entrepreneurs' Forum. Call: Patrick Milligan, (408)257-1547. [Exp. #95.]

MUSIC

Computer Music SIG. MIDI and beyond. All computer types welcome. Call: Bob Brander, (415)592-6993. [Exp. #89.]

NETWORKING

NetSIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)747-4356. [Exp. #91.]

NEURAL NETWORKS

Neural Networks SIG. SIG for Neural Networks and its applications. Call: Kumar, (408)946-5835. [Exp. #91.]

NEXT

BANG—Bay Area NeXT Group. Meetings: 3rd Wed., 7:00 pm, Terman Aud., Stanford. Presentations and lectures. [Exp. #93.]

NOVELL

The East Bay Novell Users Group. Call: George M. Gold, (510)444-4899. [Exp. #89.]

Sacramento NetWare User Group: Call: Charles Raley, (916)752-9561. [Exp. #89.]

The San Francisco Novell Users Group. Call: Thomas Thibault, (415)944-9500. [Exp. #89.]

PARADOX

Bay Area Paradox User Group—BAPALS. Meetings: 4th Tues., 4:00 pm, SF State University Downtown Campus. Forum for users and developers of all levels. Call: Robert Smiley, (415)957-4656. [Exp. #93.]

PROGRAMMING LANGUAGES

Silicon Valley Computer Society C Programming SIG. Meetings: 3rd Mon., 7:00 pm, Doubletree Hotel, 5101 Great America Pkwy., Santa Clara. Discuss C related issues and occasional speakers. Call: Fletcher Johnson, (408)283-1333 (days & early evenings). [Exp. #91.]

RACES

California Races Group. Meetings: Tues., 7:00 pm, 1491 River Park Dr., Sacramento. Technical discussions on computerized emergency communications. Call: Jim West, (916)991-5505. [Exp. #89.]

R:BASE

East Bay R:Base Users Group. Meetings: 2nd Tues. Call: Longwell Assoc., (510)451-5316. [Exp. #93.]

Peninsula R:Base User Group. Call: Don Whitecar, (415)592-5033. [Exp. #95.]

SQL

SQL_Forum/Bay Area·SQL Database Server User Group. Meetings: Once a month in downtown SF. Oracle, SQL Server, SQLBase, and more. Call: Robert Gentry, DBBS, Inc. (415)583-3000. [Exp. #91.]

TELECOMMUNICATIONS

BMUG Telecom SIG. Meetings: Last Wed., 8:00 pm. How to use your modem, terminal programs, and the BMUG BBS. Call: (510)549-BMUG. [Exp. #95.]

TEXAS INSTRUMENTS

Santa Clara Valley TIPC Group. Meetings: 4th Thurs., 7:00 pm, Magnolia Inn, 176 S. Bernardo, Sunnyvale. Newsletter, library. Call: Thor, (415)386-5237. [Exp. #93.]

TI-99/4A. Meetings: 2nd Sat., Oakland. Call: Fred, (510)530-8335. [Exp. #95.]

UNIX/XENIX

UNIX SIG. Meetings: 2nd Tues., Oracle Corp. Fitness Center, Redwood Shores. Sponsored by Software Entrepreneurs Forum. Call: Priscilla Rowe, (415)776-0513. [Exp. #92.]

UNIX/XENIX User Group of N. CA. Write: Just Computers, PO Box 355, Cotati, CA 94931, Attn: User Group. Call: BBS, (707)792-0420. [Exp. #91.]

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CREATIVE TOOLS

Continued from page 216

than going to Betacam and about the same cost as either 3/4-inch or S-VHS.

I was intrigued by the fact that the Novell client software Oxxi had been developing under contract to Commodore will now be sold by Oxxi and not Commodore.

Second, if you're developing for the CDTV and need to create a one-off test disk, you may want to contact On-Site CD, a unique service operating in the San Francisco bay area. They have a van equipped to create a CD-ROM disc within hours at your place of business. While they are currently focused on the Mac and DOS markets, they have been working with Commodore to add support for CDTV to their services. I've had personal experience with them, and they're good folks. If you need such services, give them a call to find out what they can do for you.

Third, Commodore plans to release a new version of the 500. Called the A500 Plus, it will include the ECS chip set, 1MB of chip RAM, RAM expansion to 2MB via a new A501-type RAM expansion unit, Kickstart 2.0 in ROM, and a built-in clock. No other details were available at press time. ■

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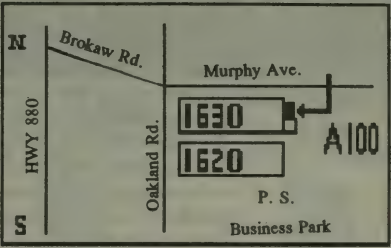

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486/25 W/64K	$ 798
386/40 W/64K	$ 578
386/33 W/64K	$ 548
386/25	$ 458
386SX16	$ 348

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- -IDE 2HD/2FD Controller
- -TEAC 1.2 or 1.44 FD
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- -1 MB RAM on Board
- -2 S/1 P/1 G Port
- -AT Case w/220 PW
- -101 Key Board

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CONNER 40MB/28ms	$162	QUANTUM 52MB/17ms	$193
MAXTOR 80MB/18ms	274	CONNER 80MB/18ms	268
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KX-1180(9 PIN)	$149	LQ-570(24 PIN)	269
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486/33 W/256K	$738	486/33 W/64K	$678
486/25 W/64K	648	386/40 W/64K	398
386/33 W/64K	378	386/25	278
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MISCELLANEOUS

80387DX/33(INTEL)	$220	WINDOW 3.0W/MOUSE	$65
80387DX/25(INTEL)	200	DOS 5.0	51
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Continued from page 60

•Try the user's password on another system, if you know what it is. Some users use the same password everywhere, meaning that whoever compromises one account can compromise them all.

You should have a different password for every system you have an account on. If you have a lot of accounts, you're probably going to want to write them down. Make sure nobody can read the list, either by keeping it in your possession, or enciphering it. Use an encipherment method that will defy casual observation—you want something more complicated than Caesar's, because that's too easy to reverse with some common computer commands. Gregg shorthand is also not suitable for obvious reasons. For most applications, this doesn't have to be overly complicated, if your passwords are sufficiently unlikely. It should be complex enough not to be readily solvable by inspection, and simple and memorable enough so that you don't have to write the method down.

•Search the user's work areas. A lot of people write down passwords near their terminals, especially for systems where they get assigned passwords like eR#)7k!2@. Or they keep them in their desks, or some such place.

If you have to write your password down to remember it, carry it with you. Under no circumstances should you write it down and leave it unattended. That includes writing it in places you think no one will look, like on the underside of the keyboard. Don't leave it in your purse. I'm willing to bet you leave that in your desk when you walk down the hall to get a cup of coffee.

The inside of a desk practically anybody can open with a ruler, and the key to which you stick under the cactus every night after you lock up, is not a great place to tape the combination of the office safe. Or your password.

•Put a serial device (such as a printer) on a privileged user's terminal line in eavesdrop mode, and record their session, including the password.

This isn't a really common approach, but it works if the physical geometry of the place makes it difficult to follow the terminal leads. If you have a choice, run terminal wires where you can see them.

If you know what you're doing, you can usually detect the presence of the extra device with a multimeter.

Because this is about common techniques, I'm not going to cover measures like Tempest equipment, designed to prevent reconstruction of the information on the terminal screen by someone who's monitoring its electromagnetic emissions. Most installations won't encounter that kind of attack.

•Try logging in with the deplorable password list.

The deplorable password list is a collection of commonly used, ill-thought-out passwords that show up repeatedly wherever good password practice isn't enforced. It consists of test, guest, and default logins that should have been changed when the system was installed; magic words, profane words, really obvious words, and words someone thought were witty. It goes without saying that your system should not contain any of these as passwords. (See sidebar)

The chances of finding some of these passwords on a sloppily secured computer of any size are fairly good. You don't have to know anything about system calls to understand that, on any really large system that will permit three-letter passwords, there's at least one guy who thinks that "sex" is an extremely clever password.

In order to defeat password-cracking programs, passwords shouldn't be words at all. The Internet worm had a password cracker that tested "weird" words, common names, and words likely to be used by people at various computers on the net ("shakespeare," for example, is not unlikely to be used at a university).

At my installation, passwords are nonsense words that are pronounceable, like "algaebaran," or letter sequences corresponding to memorable, but unlikely, mnemonic phrases—"isftiotj" (International Society for the Improvement of Tarantula Jousting).

Is "tbontbtitq," the first letters of "To be or not to be, that is the question," a good password?

No. That's a very guessable phrase.

If I have to give a password to a user, it isn't spoken aloud, and no one is entitled to know the password except the user himself and the administrators. The employee's immediate supervisor is not entitled to know his password. This can be difficult to enforce, but I consider it necessary, because in the event that an intrusion is successful, it's much harder to track possible compromises to a password used by more than one person. Also, you can't tell who typed in data by looking at the data.

Some types of opportunistic attacks are very difficult to prevent entirely, so it's necessary to monitor the system in order to detect penetrations in progress, minimize damage, and curtail the intrusions that have already occurred. Users should monitor their own accounts and report anything that doesn't make sense—mail that sounds like it should have been addressed to somebody else, anomalous last-login times, etc. Administrators should monitor the log of logins to see if repeated failed login attempts are being made to any account to try to guess a password, to see if users are recorded as logged in simultaneously in more than one place, etc.

Only by understanding how attacks on password security are carried out do you know what to look for to detect a breach, how to construct defenses, and how to evaluate the likelihood of different types of attacks for each system. ■

Deplorable Password List

hello
hello_world
love
sex
hi
work
computer
test
guest
admin
administrator
wheel
games
root
superuser
okay
help
please
system
yes
alpha
single digits
enter
boss
systems
plugh
login
aardvark
manager
service
password
opensesame
rumpelstiltskin
four-letter words
god (administrators use this)
fred (easily typed by the one-fingered)
ingres (database)
sysop
single letters
secret
demo
intro
me
account
ok
login name
company name
in
account
no
omega
first name and single digit (lisa1)
wp
xyzzy
on
names of games
names of rock groups
simple number sequences
carriage return
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386S	1MB MEM EXP BRD	113633-001	199
386/20e & 25e	4MB MEM EXP BRD	113645-001	499
386S	4MB MEM EXP BRD	113634-001	499
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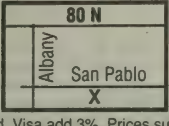

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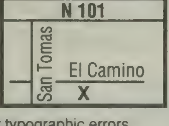

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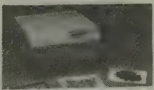

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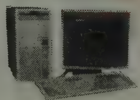

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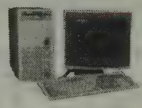

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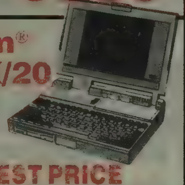

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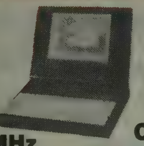

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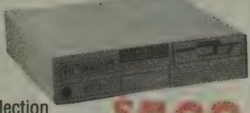

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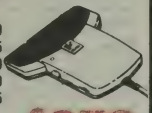

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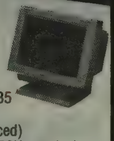

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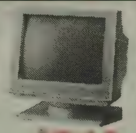

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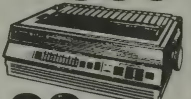

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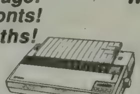

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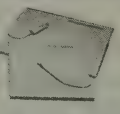

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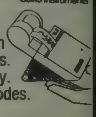

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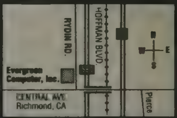

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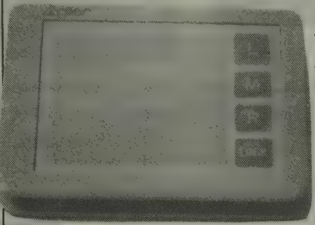

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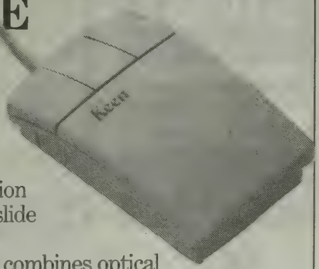

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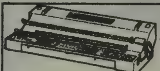

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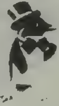

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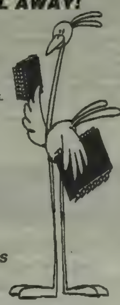

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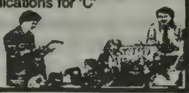

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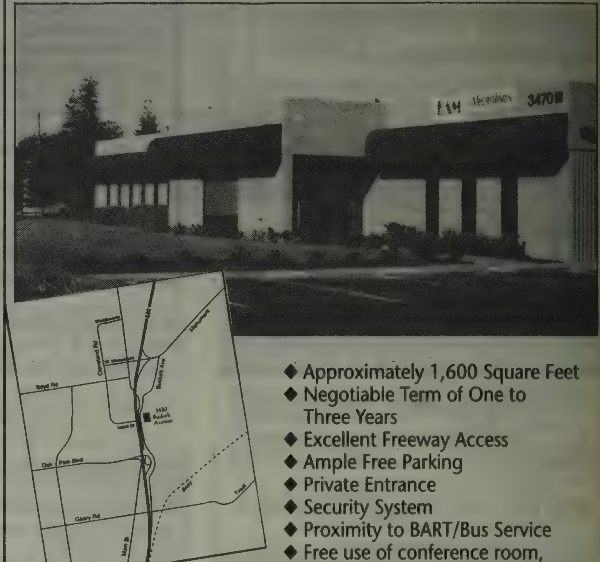

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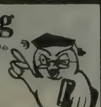

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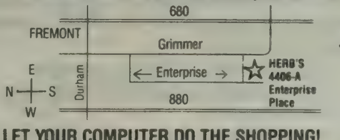

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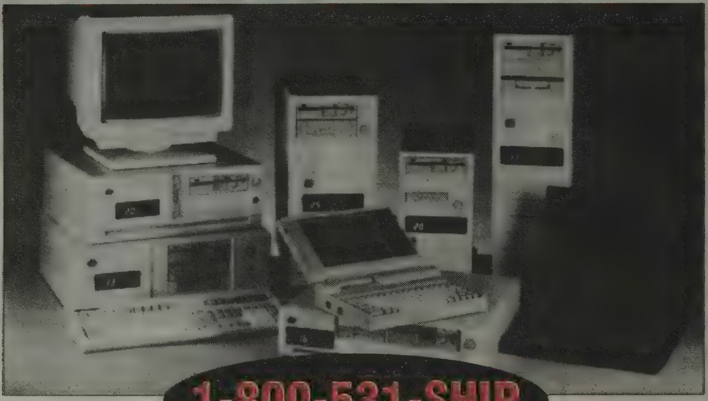

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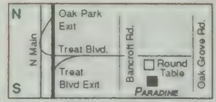

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Continued from page 22

Earnings Reports Create Turbulent Month On Wall Street

It was a turbulent month on Wall Street as the Dow Jones Industrial Average reached an all-time high of 3077 before sliding to finish the month within 1.12 points of where it began at 3004.92.

Stocks of compute-related concerns were active as well as earnings news drove the performance of both our composite index and the individual stocks therein. For the month ended October 25th, the MicroTimes Stock Index, which tracks the relative performance of the stocks in the accompanying table, gained a scant 0.2 percent to close the month at 3223.68.

The Dow Industrials were pushed to their record high by traders encouraged by the strength of third-quarter earnings reports, most of which are announced during the month of October. The economic optimism generated by these positive reports was tempered, however, as the month ended with several discouraging economic reports. The bad news caused investors to take profits and drive the national average back to within its three-month trading range to close the month.

Apple computer was one company who saw its stock price respond to earnings news as its shares gained $2.25 to close the month at $51.25. The company reported fourth-quarter earnings during the period, and although this year's figure of $0.67 a share was lower than the $0.81 reported in 1990, analysts were encouraged by the company's positive earnings trends and the potential for its new products.

Digital Equipment rebounded from the previous period's losses to post a $4.88, or 8.6 percent, rise to a closing price of $61.38. The company also reported earnings during the period, with its first-quarter results rising $0.02 a share from the previous year to a figure of $0.23 on the strength of a 6 percent rise in revenue.

Oracle added to last month's strong performance by gaining another 13.9 percent to end the trading session at $15.38. The company, which in the previous month reported positive earnings, last month was the benefactor of some strong recommendations from Wall Street analysts who feel that the stock's current price still does not sufficiently discount its potential future earnings.

Not all the news last month was positive, however, as investors were just as quick to respond to negative earnings news.

Sun Microsystems, for example, saw its shares lose $5.75, or 19.2 percent to close the month at $24.25. The reason? Goldman Sachs cut its fiscal 1992 earnings estimates for the company from $2.50 a share to $2.20 per share. Prudential Securities and Alex Brown & Sons followed suit, cutting their profit projections for Sun and leading investors to sell their shares in the company.

IBM also suffered the effects of a poor earnings report as investors drove the company's share price below $100 for the third time this year. During the month Big Blue reported third-quarter earnings declined $1.65 a share to a figure of $0.30 a share. On the month, IBM lost $4.25 to close at $98.00

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 09/27/91	CLOSING PRICE 10/25/91	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	PRICE/ EARNINGS RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	52 WEEK HIGH	52 WEEK LOW
	SOFTWARE											
OTC	Adobe		ADBE	50.25	49.63	-0.63	-1.24	22	0.32	0.64	63.00	17.00
OTC	Aldus		ALDC	40.00	41.00	1.00	2.50	23	0.00	0.00	59.88	23.13
OTC	Ashton-Tate		TATE	15.00	16.38	1.38	9.17	328	0.00	0.00	16.63	5.13
OTC	Autodesk		ACAD	50.25	42.50	-7.75	-15.42	17	0.48	1.13	62.25	36.00
OTC	Borland		BORL	45.75	48.00	2.25	4.92	24	0.00	0.00	64.25	22.00
OTC	Informix	(H)	IFMX	7.88	13.75	5.88	74.60	–	0.00	0.00	14.88	2.63
OTC	Lotus		LOTS	32.00	27.50	-4.50	-14.06	275	0.00	0.00	40.75	14.75
OTC	Microsoft	(H)	MSFT	88.25	89.50	1.25	1.42	33	0.00	0.00	92.75	41.38
OTC	Novell	(H)	NOVL	37.50	42.50	5.00	13.33	43	0.00	0.00	47.25	11.13
OTC	Oracle	(H)	ORCL	13.50	15.38	1.88	13.89	110	0.00	0.00	16.00	4.88
OTC	Software Publishing		SPCO	17.88	14.38	-3.50	-19.58	–	0.00	0.00	35.25	12.00
OTC	Symantec	(H)	SYMC	65.75	67.75	2.00	3.04	65	0.00	0.00	70.50	18.75
	HARDWARE											
OTC	Apple		AAPL	49.00	51.25	2.25	4.59	20	0.48	0.94	73.25	29.25
OTC	AST Research		ASTA	29.38	22.00	-7.38	-25.11	10	0.00	0.00	32.75	9.25
NYS	Commodore		CBU	12.50	13.75	1.25	10.00	8	0.00	0.00	21.63	6.25
NYS	Compaq		CPQ	34.50	30.25	-4.25	-12.32	14	0.00	0.00	74.25	29.88
NYS	Digital Equipment		DEC	56.50	61.38	4.88	8.63	–	0.00	0.00	83.00	46.50
OTC	Dell		DELL	32.00	27.25	-4.75	-14.84	16	0.00	0.00	36.25	9.63
NYS	Hewlett-Packard		HWP	49.00	50.25	1.25	2.55	15	0.48	0.96	56.63	24.88
NYS	IBM		IBM	102.25	98.00	-4.25	-4.16	17	4.84	4.94	139.75	94.00
NYS	Silicon Graphics		SGI	42.75	41.38	-1.38	-3.22	32	0.00	0.00	47.25	18.00
OTC	Sun Microsystems		SUNW	30.00	24.25	-5.75	-19.17	13	0.00	0.00	38.63	15.38
NYS	Xerox	(H)	XRX	61.00	61.00	0.00	0.00	11	3.00	4.92	62.38	29.00
NYS	Tandy		TAN	27.63	28.13	0.50	1.81	11	0.60	2.13	36.50	23.38
	CPUs											
NYS	Advanced Micro Device		AMD	9.63	10.38	0.75	7.79	–	0.00	0.00	14.25	3.75
OTC	Intel		INTC	42.25	42.50	0.25	0.59	11	0.00	0.00	59.25	32.00
NYS	LSI Logic		LSI	7.00	7.75	0.75	10.71	–	0.00	0.00	12.50	5.38
OTC	MIPS		MIPS	12.13	9.38	-2.75	-22.68	–	0.00	0.00	20.88	7.25
NYS	Motorola		MOT	60.50	62.50	2.00	3.31	19	0.76	1.22	71.25	45.75
	COMMUNICATIONS											
NYS	AT&T		T	37.50	38.00	0.50	1.33	59	1.32	3.47	40.38	29.00
NYS	BellSouth Corp.		BLS	49.50	47.50	-2.00	-4.04	15	2.76	5.81	56.25	46.13
OTC	MCI		MCIC	29.13	26.38	-2.75	-9.44	13	0.10	0.38	32.50	17.88
NYS	Northern Telecom		NT	39.38	40.63	1.25	3.17	21	0.32	0.79	41.00	24.00
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KEY: NYS=NEW YORK • ASE=AMERICAN • OTC=OVER THE COUNTER • (H)=NEW HIGH REACHED IN PERIOD • (L)=NEW LOW REACHED IN PERIOD • (s)=STOCK SPLIT

MARKET DIARY:

MOST ACTIVE ISSUES:

ADVANCES	19
DECLINES	14
UNCHANGED	1
NEW HIGHS	6
NEW LOWS	0

LARGEST DOLLAR GAINER	Informix	$5.88
LARGEST DOLLAR LOSER	Autodesk	$-7.75
LARGEST PERCENTAGE GAINER	Informix	74.60 %
LARGEST PERCENTAGE LOSER	AST Research.	-25.11 %

CLOSING QUOTES FOR CHART:

	CLOSE 09/27/91	CLOSE 10/25/91	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH
MICROTIMES STOCK INDEX	3216.77	3223.68	6.91	0.21
DOW JONES INDUSTRIAL AVERAGE	3006.04	3004.92	-1.12	-0.04
STANDARD & POOR'S 500 STOCK INDEX	385.90	384.20	-1.70	-0.44
N.Y.S.E. COMPOSITE	212.21	211.82	-0.39	-0.18
NASDAQ COMPOSITE	524.48	525.13	0.65	0.12

DATE	MICRO TIMES	DOW JONES
04/05/91	3298.59	2896.78
05/06/91	3209.84	2941.64
06/05/91	3178.90	3005.37
07/05/91	2850.09	2932.47
08/02/91	3132.83	3006.26
08/29/91	3265.70	3049.64
09/27/91	3216.77	3006.04
10/25/91	3223.68	3004.92

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Continued from page 30

extenders, so I gotta reedit my Autoexec and Config Dot Sys files each time and reboot. And the tables were done with XROFF, under XENIX. I've spent hours digging through documentation, trying to convert the files...Yes, I know this is Timothy's first Christmas, but I've gotta finish this before I come home...I don't know, by dawn, I hope...I love *you* too, dear."

The CEO awoke, startled, and sat straight up, back in his bed, back home. "I had no idea!" he exclaimed. "When we adopted Procter and Gamble's soap-powder approach to software marketing, I thought OS proliferation would just make users buy more of our programs off the shelves. I just wanted to boost sales. I didn't know what a compatibility disaster we'd create!"

"Cee Colon Root Directory" the computer intoned. "Autocad Slash Dot Null...Autoexec Dot Bat...Config Dot Sys..." Timmy scowled. He'd meant to open the game directory first, and this recitation could take forever. "Control Alt Delete!" he interjected.

But he was speaking to no one. The ghastly figure in white was gone.

THE LAST OF THE SPIRITS

There would be *three* visions, Kildall's ghost had warned, so the CEO slumped back, emotionally drained, expecting the worst. Suddenly, a cold wind blew through the room, and the CEO looked up. A tall, faceless figure towered overhead, cloaked only in a hooded blue robe.

"And you," the CEO asked, "Are you the Ghost of Operating Systems Future, come to torment me as well?" But the hulking figure stood silent, and beckoned the CEO again to the window.

This time, he found himself looking into a residential living room. Cratchit was there again, setting a book-sized object below a brightly decorated tree. He looked older now, with graying temples and thinning hair. "You know, dear," he said to a dark-haired woman with soft, kindly eyes, standing by the staircase, "I'm sure glad we got Timmy this Micro 2000 computer. Technology's come a long way these last ten years. The Intel 786™ microprocessor contains four 386-compatible CPUs, two i860 vector coprocessors, a DVI subsystem with super-enhanced ZGA, and half a meg of cache. 200MHz, 1.2 GOPS...it's just incredible, honey!

"And the software's better, too. The OS automatically configures fourteen different DOS extenders, with built-in drivers for flash disks, CD-ROMs, color LCD displays, pen-pad entry, animated icons, ear-cons, and speech synthesis—the works. And even with all the drivers permanently installed, the 16MB main memory chip still has room for a 640K application program. I'm glad everything's voice operated now—a keyboard and display would have put us way over budget."

His wife smiled sweetly, patiently. "We're in debt as is, Bob. I swear, you spend far too much on Timmy's presents every year. MacAnalyst says you're still overcompensating for that Christmas you didn't get home 'til the 29th. Oh well, maybe it will help Tim with his school work." She turned to the stairs and shouted, "Okay, Timmy, you can come down now. Santa's brought a big pile of presents!"

A young boy ran eagerly into the room. "Hyper hyper hyper hyper *hyper!* A Micro 2000 computer!" he shouted, seeing the nondescript brown tablet below the tree. "Megarad *plus!*"

"System Power On!" he directed, and then, while the OS began its lengthy reboot ritual, he began opening his other presents. Several minutes later the box spoke out in a cool, mechanical voice.

"Power On Self Test Successful," it said. "Microsoft DOS Version Eight Point Three Bee Seven, Copyright Two Oh Oh Oh." Another long pause. "Bee Colon Root Slash Prompt."

Timmy was ecstatic! He'd used computers since Mrs. Fredricks' first-grade PC-education module, so he knew exactly what to say. "Cee Colon Return!" he instructed. "Dir Star Dot Star Return!"

"Cee Colon Root Directory" the computer intoned. "Autocad Slash Dot Null...Autoexec Dot Bat...Config Dot Sys..." Timmy scowled. He'd meant to open the game directory first, and this recitation could take forever. "Control Alt Delete!" he interjected.

THE END OF IT

The CEO spun around and looked back at the spirit in tears. "Is *this* what will become of the PC software industry? Will things never change? Will users forever be shackled by a brain-dead user interface? This has *got* to be fixed! I'll *see* that it gets fixed! I'll convert everything to the 386 architecture. I'll learn the 386 protection model. I'll even find out what 'virtual memory' means! I'll make DOS as user-friendly as the Macintosh. I'll do it, I swear to God I will, even if I have to write it all myself, in BASIC!" And with that the specter smiled wanly, and vanished in a wisp of smoke.

...And the CEO was better than his word. He set a team of his best and most creative designers to work, and he gave them free rein to follow their dreams. The resulting OS was not just easy to use, it was universal. It could run multiple tasks, on multiple processors, in multiple windows, each protected from the rest.

The CEO awoke, startled. "I had no idea!" he exclaimed. "When we adopted Procter and Gamble's soap-powder approach to software marketing, I thought OS proliferation would just make users buy more of our programs off the shelves. I just wanted to boost sales. I didn't know what a compatibility disaster we'd create!"

It could run on any hardware, load any command file, and automatically emulate the machine language and OS interface of non-native applications. With protection enabled, users were finally freed from the threat of viral infections and unauthorized access. So DOS was *not* permanently crippled, but grew to become healthy and strong, and PC user productivity everywhere increased happily ever after.

Merry Christmas, dear readers, and God bless us, every one. ■

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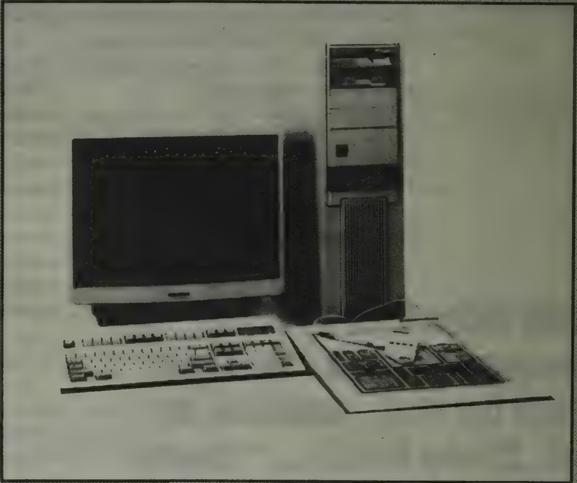

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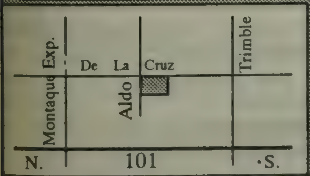

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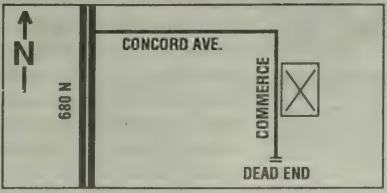

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An Ode To The CD-ROM

Look For The Bandwagon, It's Time To Jump On It

BY JOHN C. DVORAK

> *While the optical disc may find many specialized uses, it surely will not become the popular "on everyone's desk" accessory as expected. At least not until someone comes up with a new use for the device. Give it at least five years to find a niche.*
>
> **— J. Dvorak, writing in the August 1986 issue of the *DEC Professional*.**

Well, pundits can sometimes be right. It's been five years since I wrote the cautionary note above, and it's time to reevaluate CD-ROM, because 1992 will begin the explosion of acceptability.

For those of you needing some background, let's outline all the kinds of optical devices that might find their way onto the desktop. First there's the CD-ROM. It's a compact disc with data instead of music. Now there's the CDI, a compact disc with data and/or music. Then there's a flood of 5 1/4" media, including a write once disc, a read-only disc, a read-write disc, and even a disc that has characteristics of read-only on part of the disc and read-write on the other part. And let's not forget the video disc. Some discs come in a solid cartridge that looks like a giant Macintosh diskette. Then there's CDTV—the proprietary Commodore system. Finally, there's CD-XA, which is CD with nifty extensions.

DVORAK'S LAST COLUMN

All you need to know about for the moment is plain CD-ROM.

CD-ROM will become the medium for mass storage of research data. This is not data for researchers, but data for everyone. I already use Computer Select and Magazine Rack from Information Access (Foster City, California). Magazine Rack is fascinating, as it's an $89 CD-ROM disk containing 850,000MB (they compressed the data). It's essentially an entire year's worth of articles from over three hundred magazines. Magazine Rack is an outstanding work, and we can expect to see similar products from other vendors.

I also use Front Page News, the Time Almanac, US History on Disk, the 900 Great Works of Literature, and other disks to help me in my column writing. Now there is a cross-referenced California phone book too. If you've *ever* had to look anything up for any purpose, you'll find it on CD-ROM someday. It will take less space and be easier to use than any reference book.

One of the most interesting CD-ROM makers in the country is Quanta Press, 2239 Carter Avenue, St. Paul, MN 55108. Phone the company at (612)641-0714 (telephone), (612)644-8811 (fax) to get a listing of its unique software. An example is The Officer's Bookcase, a full-text database. It's the equivalent of a dictionary of military-oriented terms and acronyms. The content of The Officer's Bookcase includes the Joint Chiefs of Staff's "Military Terms Dictionary" and the Defense Systems Management College's "Defense Acquisition Acronyms and Terms." A separate file area on the disc contains the volume "Soviet Terms Dictionary" from the Soviet Military Thought Series. All of the terms and acronyms found in The Officer's Bookcase CD-ROM were obtained through public domain sources, so this is legal!

This separation of US/NATO/IADB terms from the Soviet terms allows operational personnel to concentrate on their tasks, while intelligence researchers can avoid the US military routine.

The entire database covers terms from the 1960s to the present. This gives the end-user broad word/phrase selection capabilities. The Officer's Bookcase CD-ROM uses a customized version of a famous software package called LIST, by Vernon Buerg, for its search and retrieval.

Quanta Press has plans for an annual update of The Officer's Bookcase. Quanta is also actively seeking defense contractors who wish to contribute internal terms and acronyms lists to this dataset. The Officer's Bookcase may be purchased directly from Quanta Press for $149.

Also from Quanta look for Dick's Some of the Earth's Planes—a visual compendium of aircraft. Information is retrieved from the database via direct word or phrase searching, and by browsing the text. Hundreds of black-and-white photographs and VGA full-color images are available by the simple use of a hot-key (F9). It's $249.

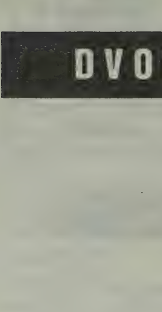
Finally, topping off the Quanta list is The CIA World Factbook. This annual CD-ROM is an almanac that describes hard facts and figures of 248 countries and territories worldwide. Geopolitical, socioeconomic, demographic, and other country-specific data is accessed via full-text search-and-retrieval software. There is also an image section that contains 248 line drawing maps (300dpi) for desktop publishing. It's $99. This is hot stuff, especially for political mavens.

And then there's the game business. CD-ROM's popularity will increase dramatically when Nintendo rolls out a CD-ROM-based game machine, which is expected to ship within the next year. The current need for games to have a bunch of hard-wired chips in a game cartridge is just plain ludicrous (and expensive!) when it can all be done in software on a CD-ROM.

The expectation is that Nintendo, popularizing the technology, will finally trigger the price curve into a downward spiral—at least for the low-performance mechanisms.

In other words, the five years are up and it's time to think about buying a CD-ROM. Heavy users like myself will find solace in the arrival of the CD-ROM player that's a jukebox, which can hold a dozen or more disks. While a CD-ROM may contain 500MB or more of data, most users will find that they have to access more than one disk to accomplish their computing goals, especially if they are doing research. This bottleneck is probably a more critical time killer than the slow access time.

I'm reminded of a point made once by a computer engineer friend as we discussed the speed of the Cray 2 supercomputer. He said that to calculate the true speed of a supercomputer (or any computer for that matter) you have to add the queue time to the execution time. If you have to wait three months to have your program run, then what's the point if the execution time is only a few seconds? CD-ROMs' usefulness is limited by this time-consuming switching of disks. Still, it's faster than a trip to the library. ■



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John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine and MacUser, and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.

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☐ Q. Medical & Health Services
☐ R. Consulting Services
☐ S. Wholesale/Retail Trade
☐ T. Communications
☐ U. VAR/Dealer/Distributor
☐ V. Software Developer
☐ W. Independent Computer Consultant
☐ X. Systems Integrator
☐ Y. Manufacturer of Computers/Systems/Peripherals
☐ Z. Other Business ____________ *(please specify)*

3. Number of employees in my organization (all locations):
☐ AA. 1 - 50
☐ BB. 51 - 500
☐ CC. 501 - 5000
☐ DD. Over 5000

4. Number of years I have used UNIX:
☐ EE. None
☐ FF. 1 to 5 years
☐ GG. Over 5 years

5. Types of computer systems I currently use:
☐ HH. Mainframe computers
☐ JJ. Minicomputers
☐ KK. Small business computers
☐ LL. Microcomputers, including PCs

6. I specify or influence the purchase of (check all that apply):
☐ MM. Mainframes/Superminis
☐ NN. Minicomputers/ Small Business Computers
☐ OO. Microcomputers/Desktops
☐ PP. Software (Operating System)
☐ QQ. Software (Applications)
☐ RR. Communications Systems
☐ SS. Office Automation Systems
☐ TT. LAN Equipment/Systems/Services

7. My company's total gross sales or revenues (in millions):
☐ UU. Under $1 million
☐ VV. $1-$24
☐ WW. $25-$99
☐ XX. $100-$249
☐ YY. $250-$499
☐ ZZ. $500 and over

NOTE: No one under the age of 18 admitted.

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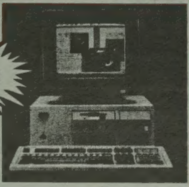

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20MHz 80386SX Processor ▪ 2MB RAM Expandable to 16MB ▪ 1.44 MB 3.5" Floppy Disk Drive
80MB Maxtor Hard drive ▪ Goldstar 3051 VGA Display ▪ Super VGA on Mother Board
Serial/Parallel Ports ▪ Clock/Calender
101 Key Keyboard ▪ 3 AT Bus Slots
IBM DOS 5.0
#1639395

$1849*

* PRICE AFTER $150 REBATE
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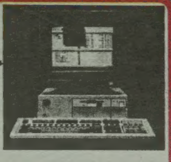
IBM® PS/2®

MODEL 40SX



FREE** SOFTWARE BUNDLE

80386SX 20MHz Processor
2MB RAM Expandable to 16MB
3.5" 1.44MB Floppy Disk Drive
5 AT Bus Slots
Super VGA on Mother Board
Serial / Parallel Ports
101-Key Keyboard
Clock/Calendar
IBM DOS 5.0
Montior Not Inculuded
#1636576

$1795*

* PRICE AFTER $200 REBATE
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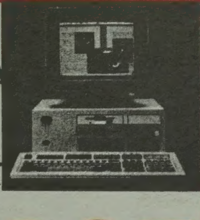
IBM® PS/2®

Model 55SX 60MB VGA W/IBM VGA DISPLAY



FREE** SOFTWARE BUNDLE

16MHz 80386SX Processor
3 - 16 Bit Microchannel Slots
VGA On Mother Board
2MB RAM Expandable to 8MB
60MB 27ms Hard Disk Drive
3.5" 1.44MB Floppy Disk Drive
IBM DOS 5.0 ▪Serial/Parallel Ports
101-Key Keyboard ▪IBM 8513
Color VGA Monitor ▪ Clock/Calender
#1626296

$2195

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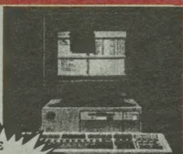
MODEL 57SX 80MB HARD DRIVE



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5-16 Bit Micro Channel Slots
4MB RAM Expandable to 16MB
80MB 17NS Hard Disk Drive
3.5" 1.2MB Floppy Disk Drive
Super VGA On Mother Board
Serial/Parallel Ports
101-Key Keyboard
Clock/Calendar
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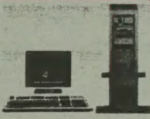
$2599

IBM® PS/2®

Model 65-321 386SX TOWER W/ 320MB HARD DRIVE



16MHz 80386 Processor ▪ 2MB RAM Expandable to 32MB Memory ▪ 3.5" 1.44MB Floppy Disk
320MB 12.5ms Hard Drive ▪ VGA On Mother Board
Serial / Parallel Ports ▪ Clock / Calender
101 Key KeyBoard ▪ Monitor Not Included
#1636716

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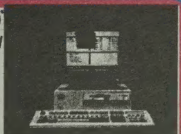
IBM® PS/2®

Model 70-A81 25MHz 386

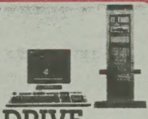


80386DX 25MHz Processor
80MB 16MS Hard Drive
4MB RAM Expandable to 8MB
3.5" 1.44MB Floppy Disk Drive
1-8 Bit 2-16 Bit Micro Channel Slots
101 Key Keyboard ▪ Clock/Calendar
Serial / Parallel Ports ▪ Monitor Not Included
#1636750

$3995

IBM® PS/2®

MODEL 95-OJD 25MHz 486 W/320MB HARD DRIVE



80486 25MHz Processor ▪320MB 12.5MS Hard Drive
8MB RAM Expandable to 32MB
XGA Graphics on Mother Board Tower Case Design
6-32 Bit Micro Channel Bus Slots ▪ Serial / Parallel Ports
3.5" 1.44MB Floppy Disk ▪ 329 Watts of Power
101 Key Keyboard ▪ Clock/Calendar
Monitor Not Included
#16368759

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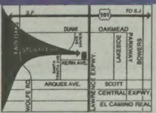
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DUANE
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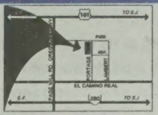
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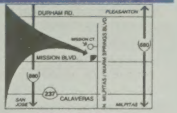
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(510) 770-3700

We're Sorry.

What we really meant was:
QEMM-386 makes the most of every last 'K'—automatically. It finds more RAM between 640K and 1 megabyte than DOS 5 or any other memory manager. Lots more.

We under-sold Optimize.
Optimize does everything we said it does, but it manages your memory much more smoothly and quickly than you'd guess from this ad. It checks out virtually every possible combination of memory mapping—automatically.

We under-stated high memory gain.
QEMM-386 finds even more memory than we said—211K additional high memory in most cases. (We wanted to be conservative, but on most PCs, we got over 200K more room for TSRs and drivers between 640K and one megabyte.)

Oops!
When we said that all other memory managers require you to manually re-allocate memory between expanded and extended types, we should have said most memory managers require manual re-allocation, and none find more useable high memory.

Our new QEMM whips DOS 5 into shape.

Quarterdeck

We left out Squeeze.
Some TSRs require a lot more memory to start than they do to run. Squeeze increases available memory to accommodate their memory demand, then cuts it back to just what's necessary. The result? You can get more TSRs and utilities out of the way, and eliminate wasted memory.

Then there's VidRAM.
QEMM-386 can use memory set aside for graphics when you only need text. That's up to an additional 96K without rebooting!

Manifest is included, free.
Award-winning Quarterdeck Manifest is included with both QEMM-386 and QEMM 50/60. It's a $60 value that provides information you simply can't get any other way. And it makes memory simple to understand.

Save time; gain performance.
QEMM lets you use the TSRs you want and still leaves lots of room for network drivers, utilities and memory-hungry programs. You'll get fewer "out of memory" messages and get more work done smoothly and quickly.

Results of running QEMM-386 v.6 with Stealth*

	DOS 3.3		DOS 4.0		DOS 5.0	
Model	DOS Program Size	Avail High Mem	DOS Program Size	Avail High Mem	DOS Program Size	Avail High Mem
IBM PS/2 80	581K	211K	572K	211K	620K	211K
Compaq 20e	581K	211K	572K	211K	620K	211K
ALR VEISA	582K	211K	573K	211K	620K	211K

This chart shows how big a DOS program can be and how much high memory is made available when you use our new QEMM-386. Sorry it isn't more colorful.

Apparently this ad was misleading.

Trying not to over-promise, we were too cautious with our claims.

The truth is, QEMM-386 v.6 is better than we made it sound.

Not only does it typically find a lot more memory than we claimed, it also does its memory management job more quickly, smoothly and unobtrusively than we lead you to believe.

Stealth, our new RAM-gain feature, 'maps' ROM into other areas of memory—to provide you with the maximum available RAM between 640K and 1 megabyte. That's space QEMM then uses to load memory-hogging TSRs and drivers (like network software) out of the memory areas your big programs need.

How it works is not as important as the end result—more useable high memory—as much as 211K!

Our Optimize feature works better, too. From its new interface to the way it works with Stealth to calculate memory usage better, for maximum memory gain.

QEMM-386 helps your programs run faster by giving them more memory. And it works great with any DOS from 3.3 to 5. And Windows, too. It's an essential tool for anyone who wants to get the most productivity out of the hardware and software they're using today.

#1

QEMM is the #1 selling utility according to PC Magazine.

INFO WORLD
INFO WORLD
TOP 100
QEMM 386
PC WEEK
SCORE 8.6
PC Computing
MVP
MOST VALUABLE PRODUCT
THE BEST
LOTUS
BYTE
AWARDS
BYTE
AWARDS

QEMM has won more recognition than all other memory managers combined.

Quarterdeck

* Here we are, being cautious again: Because Stealth alters the memory mapping of your PC, how much high memory you'll gain depends on the 'BIOS' in your computer. We've tested Stealth on a wide range of PCs, from Compaqs to PS/2s; ALRs, Toshibas and many others. Typically, an additional 211K becomes available between 640K and 1 megabyte. Depending on your PC, your memory gain may vary.

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